TATSUNO EUROPE a.s.

INSTALLATION AND USER MANUAL

OCEAN ADBLUE® DISPENSER

BMP 4000

OCEAN

Document:	Installation an User Manual for dispenser OCEAN AdBlue
File:	IN025-EN InstallationInstructionsOceanAdBlue_rev01
Revision & Date:	Revision 01, February 11. 2014
No. of pages:	62 (including cover)
Created by:	Milan Berka, Karel Viktorin
TATSUNO EUROPE a.s., Pražská 2325/68, 678 01 Blansko, Czech Republic, tel.+420 516 428411, http://www.tatsuno-europe.com	

© TATSUNO EUROPE a.s.
Pražská 2325/68 • 67801 Blansko
Czech Republic
Tel: +420 516428411 • Fax: +420 516428410
E-mail: info@tatsuno-europe.com, http://www.tatsuno-europe.com

TATSUNO EUROPE a.s. © Copyright

Neither this manual nor any of its parts may be copied without the consent of

TATSUNO EUROPE a.s.

CONTENTS

CONTENTS 3

INTRODUCTION 5

0. INTRODUCTORY INFORMATION 7

0.1. Symbols Used in this Manual 7
0.2. Study the Manual First 8
0.3. Permitted Use 8
0.4. Brief Characteristic of the Used Medium AdBlue® 9
0.4.1. Legislation and SCR Technology 9
0.4.2. AdBlue® 9
0.5. Health and Safety 9
0.5.1. Safety Checklist 9
0.5.2. Duties of the Employees 10
0.5.3. Hazards 10
0.5.4. Personal Protective Equipment 11
0.5.5. First Aid Procedures 11
0.5.6. Storage of AdBlue® 13
0.5.7. Spillage of AdBlue® 13

1. TATSUNO ADBLUE® DISPENSERS 15

1.1. Basic Specifications 15
1.2. AdBlue® Dispenser Description 16
1.3. Survey of Available Models 18
1.3.1. Additional Abbreviations in the Dispenser Marking 18
1.3.2. Basic Models of AdBlue® Dispensers 19
1.3.3. Dimensions & Weights 19
1.3.4. AdBlue® Dispenser Figures 20

2. INSTALLATION 23

2.1. Instructions for Safe Work 23
2.2. Receipt, Transport, Unpacking 23
2.3. AdBlue® Dispenser Installation and Layout 24
2.4. Mechanical Mounting of AdBlue® Dispenser 25
2.5. AdBlue® Dispenser Wiring 27
2.5.1. Switching of AdBlue® Submersible Pump 27
2.5.2. Feeding of Electronic Counter, Switching Elements and Heating 28
2.5.3. Data (Communication) line 28
2.5.4. Service Lines 30
2.5.5. Cable characteristics 30

3. BASIC FUNCTIONS AND DISPENSER SETTING 35

3.1. PDEX Counter 35
3.1.1. PDERT Remote Controller Description 35
3.1.2. Displaying Data in Setup Mode 37
3.1.3. Operator Mode 38
3.1.4. Manager Mode 38
3.1.5. Non-Resettable Volume Totalizers (Code 01) 39
3.1.6. Daily Totalizers (Code 02) 40
3.1.7. Unit Price (Code 03) 40
3.1.8. Current Time and Date (Code 04) 40
3.1.9. Displaying of the Program Version and Check Sums (Code 05) 41
3.1.10. Error Message History (Code 06) 41
3.1.11. History of Latest Transactions (Code 07) 42

3.1.12. Access Password to the Manager Mode (Code 08) ... *43*
3.1.13. Maintenance History (Code 09) ... *43*
3.1.14. Dispenser Operating Mode (Code 12) ... *43*
3.1.15. Error Statistics (Code 13) ... *43*
3.1.16. Current Operating Temperature (Code 14) ... *44*
3.1.17. Resetting Daily totalizers (Code 15) ... *44*
3.1.18. Manufacturer's Lock Code (Code 16) ... *45*
3.1.19. Display Backlight Intensity (Code 17) ... *45*
3.1.20. Text Messages of the Graphical Display (Code 18) ... *45*
3.1.21. Display Segment Error (Code 19) ... *46*
3.2. TBELTx Counter (TBELT2 or TBELT4) ... 46
3.3.1. Product Unit Price Setting ... *46*
3.3.2. Reading of Electronic Totalizers ... *47*
3.3.3. Operating Mode Change ... *48*
4. OPERATION ... 49
4.1. Instructions for Safe Use ... 49
4.2. Putting the AdBlue® Dispenser Into Operation ... 50
4.3. Operation of the AdBlue® Dispenser ... 50
4.3.1. AdBlue® Dispensing ... *51*
4.3.2. Correct AdBlue® Nozzle Usage ... *52*
4.3.3. AdBlue® Thermostat and Heaters ... *53*
4.3.4. Pre-selection Keyboard ... *53*
4.3.5. Electromechanical Liter Totalizers ... *54*
4.4. End of AdBlue® Dispenser Operation ... 54
5. MAINTENANCE AND SERVICE ... 55
5.1. Main Principles for AdBlue® Dispenser Maintenance ... 55
5.2. Principles of AdBlue® Dispenser Monitoring ... 56
5.3. AdBlue® Dispenser Error Mesages ... 56
5.3.1. Error Message Types ... *56*
5.3.2. Error Messages Codes ... *57*
5.4. AdBlue® dispenser Operation ... 59
5.5. Warranty and Complaints ... 60
5.6. Accessories ... 60

INTRODUCTION

This manual is for users of the TATSUNO dispensers of the OCEAN series AdBlue model, as well as for designer studios who design petrol stations. The company TATSUNO EUROPE a.s. recommends thoroughly studying the manual including its attachments. The manual must be available to the dispenser operators during installation and regular maintenance.

- Keep this manual with its attachments over the whole life time of the dispenser
- Make it available to other owners and users as well
- Perform updates of the regulations (see www.tatsuno-europe.com)

At the time of publishing the attachments properly reflected reality. The producer reserves the right to change technical conditions of the equipment or its attributes without a written notice, due to the continuous development and improvements.

All rights are reserved. No part of this manual may be reproduced or transmitted without a written consent of the company TATSUNO EUROPE a.s.

Document revisions

Revision No. / Date	Change description	Made by
Revision 00, 10. 1. 2014	Basic version of document (Czech)	Milan Berka
Revision 01, 11. 2. 2014	Translation into English	Karel Viktorin

0. INTRODUCTORY INFORMATION

0.1. SYMBOLS USED IN THIS MANUAL

Warning

Beware of electrical appliance

No smoking

No open fire

No mobile phones

Terms used in this manual requiring special attention:

CAUTION *Violation of these requirements may create conditions, which may lead to injury or death of persons or to substantial damage to property.*

WARNING *Violation of these requirements may lead to injury of persons and/or damaging of the dispenser.*

NOTICE *This text informs about legal and/or statutory requirements concerning the installation and use of the dispenser. Violation of these requirements may create a hazardous situation and/or it may lead to damaging of the dispenser.*

NOTE *This text informs about installation procedures, techniques and operation methods etc., which are important for securing of proper installation and operation of the dispenser and which, if violated, may lead to damage, failure or bad performance of the dispenser.*

0.2. STUDY THE MANUAL FIRST

Before installing or using the dispenser, first study the relevant parts of the Installation and User Manual. Take into account all the hazards, warning and notes in the Manual.

The producer provides this Installation and User Manual in order to present all the necessary information and instructions for full and efficient installation, use and maintenance of our dispensers of the OCEAN BMP4000.OE /AdB EURO type.

This Manual was created by the producer and it forms an inseparable part of the dispenser accessories.

The use of this Manual is at the full responsibility of the user; any operations not described here must be considered forbidden. An operator who performs such operations will assume all responsibility for the impact of such actions.

The Manual is organized into individual sections, which have their subsections, so each topic is separated and corresponds to the logical sequence of operations (learn – prepare – use – maintain).

The Manual properly reflects the technical situation at the time of sale of the dispenser and it cannot be deemed faulty if there are subsequent changes and updates to the latest status and new information.

NOTICE
Keep this manual and enclosed documents over the whole service life of the appliance for future reference!

0.3. PERMITTED USE

The dispensers of the OCEAN BMP4000.OE/AdB type are intended for stationary use, for dispensing of the AdBlue® medium in specified quantities from the storage tank to the vehicles.

CAUTION
The dispenser is a complicated appliance which must provide many demanding functions. ***Consequently, before commissioning, the tanks and pipes must be cleaned and the cleanliness of the AdBlue® medium must be verified (dirty filters in the dispenser cannot be considered as a reason for warranty repair!). Before commissioning, the electricity wiring and proper connections must be reviewed to prevent electric shock injury and to ensure explosion protection.***

Every fuel dispenser is properly tested at the production plant regarding its function, safety and metrology. The delivery of each fuel dispenser includes certificates necessary by the operator as documentation for authorities.

0.4. BRIEF CHARACTERISTIC OF THE USED MEDIUM ADBLUE®

0.4.1. LEGISLATION AND SCR TECHNOLOGY

All vehicles above 3.5 tons fall into the class of heavy duty and are subject to new European heavy duty regulations. These regulations set maximum emission values for PM and NOx. In order to meet the new requirements of the European standards EURO IV and EURO V, European truck manufacturers are forced to implement new technologies. Selective Catalytic Reduction (SCR) technology involves the destruction of NOx through the reaction with ammonia, resulting in harmless water and nitrogen. The Urea solution required by the SCR system is called **AdBlue®**. It is stored in a tank in the vehicle and injected in the exhaust system, where the reaction takes place. To meet the Euro IV standard, the expected AdBlue® consumption is around 5% of the diesel consumption, asking for tank sizes varying from 50 l to 100 l. For Euro V, this consumption is expected at 6-7%.

0.4.2. ADBLUE®

AdBlue® is a solution based on a mix of 32.5% of urea, water and some additives. This mixture was chosen because it has the lowest crystallization temperature. To ensure correct operation of the SCR over its lifetime, AdBlue® quality needs strict control. It is therefore specified in a standard (DIN 70070). Further physical properties of the AdBlue® include:

- AdBlue® freezes at -11°C
- AdBlue® is highly corrosive since 67.5% is water
- AdBlue® shows strong crystallization and creep

0.5. HEALTH AND SAFETY

0.5.1. SAFETY CHECKLIST

- Any smell of ammonia must be reported immediately.
- It is imperative that this checklist be fully complied with during all work at the filling station, particularly construction and repair work.
- It is the duty of the contractor to ensure that all workers employed by him obey each and all of the relevant laws, directives and other regulations.
- AdBlue® liquid must only be stored in AdBlue® compatible containers/storage tanks.

Areas requiring special caution

- The insides of tanks, tubes, dome shafts, filling shafts, change over shafts, vessels and dispensers.
- All areas in which AdBlue® vapor which is heavier than air can accumulate, e.g. AdBlue® separator, draining shafts, low located rooms, cellars, excavations, pipe trenches etc.
- The areas around the outlets of tank ventilation pipes, especially during the filling phase.

- All areas near dispensers, tanker lorries and other vehicles while they are being tanked up, and particularly when there is a lack of wind.
- A radius of 1.0 meters around petrol carrying pipes, as well as pipes that are not vapor free.
- Silt traps.

0.5.2. DUTIES OF THE EMPLOYEES

- To ensure optimal accident prevention, in addition to general rules applying to worker's protection, it is necessary to take into account all the national protection of workers legislation and to actively support all measures which enhance safety standards.
- It is an employee's duty to follow all company directives regarding the prevention of accidents, unless such directives can be proved to be unfounded.
- Employees should not follow any instructions that go against safety standards.
- Employees are only permitted to use equipment for its original purpose, and this is defined by the company alone.
- If an employee detects equipment that is deficient in terms of safety, he shall eliminate this deficiency immediately. If such safety rectification is not part of his defined area of activities or if his knowledge is insufficient to carry out such work he must immediately inform his superior about the detected safety deficiency.

The same applies to the following:

1) **Work Materials,** which have not been correctly packed or marked to meet safety requirements.
2) **Work Methods and Processes**, which have not been correctly coordinated or controlled in order to meet safety requirements.
3) **Where dangerous activities are carried out by several persons**, the need for a permanent faultless communication between them in order to avoid dangerous events shall require the appointing of one person to carry out overall supervision.

0.5.3. HAZARDS

Prior to starting work, the dispenser must be isolated (i.e. entirely disconnected from the main supply) and the main supply switch locked in the OFF position. The submerged pump (if applicable) and control signals from the dispenser must also be isolated. This is done to provide safety for the technician. As a further precaution, switch off the main supply in the service station shop and place a clear notice on the switch to avoid it being turned on again inadvertently. It is not permitted to put an AdBlue® dispenser into operation before an authorized official has inspected it and released it. This depends upon the national regulations in force. Dismantled packaging and cladding must be stored in such a way as to avoid damage to components or injuries to persons. Covers that can be opened, such as the counter housing, should be handled with care. Ensure that the retaining catch is placed in the correct position to prevent the cover falling onto the head of service engineers or other persons in the area.

At unattended service stations, every end-user should have access to the User Instructions. They should be visible on a notice board or integrated into the DIT and should be sufficiently well lit so that they can be read at night. At unattended service stations break away couplings must always be used to reduce the danger caused by a motorist driving off with the nozzle still in the tank.

WARNING

THE CONNECTION AND DISCONNECTION OF ELECTRICAL CONNECTIONS MAY ONLY BE CARRIED OUT BY QUALIFIED PERSONNEL AUTHORIZED FOR SUCH ACTIVITIES. WORK IN DANGEROUS AREAS MUST BE MADE SAFE BY OBSERVING ALL THE NATIONAL SAFETY REQUIREMENTS IN FORCE.

0.5.4. PERSONAL PROTECTIVE EQUIPMENT

Protective Clothing

The following clothing should be worn **at all times** during installation and maintenance procedures:

- Protective helmet.
- Protective shoes (conductive).
- Protective gloves and/or protective hand cream.
- Anti static clothing.
- Eye protection.

Safety equipment for working in hazardous areas

The following safety equipment is required for working in hazardous areas:

- Only spark free tools are permitted for work on dispensers.
- Work on bearings is only permitted using the standard workshop tools authorized for this kind of work.
- The use of all electrical tools is strictly prohibited.
- Only the use of explosion protected work lights is permitted.
- The use of telecommunications equipment in hazardous areas is strictly prohibited.

Safety instructions

The following safety instructions must be adhered to during installation and maintenance procedures:

- Inhalation of AdBlue® vapor must be avoided. Suitable precautions must be taken and, where necessary, respirators used.
- Avoid direct contact of AdBlue® with the skin.
- Use suitable protective clothing, protective gloves and/or protective hand cream.
- Avoid AdBlue® spills.
- No smoking, no naked flames are permitted.
- Long hair and ties can get caught in moving parts. Hair must be suitably covered.

0.5.5. FIRST AID PROCEDURES

Safety Data Sheets for all products should be available at the service station. These sheets contain important health and safety information relating to the individual product and the specific precautions to be followed in the event of prolonged contact, inhalation or consumption.

AdBlue® is a clear liquid with little or no odor making leakages difficult to detect. After a period of time the odor may change to a strong ammonia stench. Decomposition on heating may produce toxic fumes of carbon monoxide, carbon dioxide, nitrogen oxide and ammonia reducing the amount of oxygen in the air.

In the event of personal contact with AdBlue®, the following procedures should be carried out

Eye injuries

If the eyes have come into contact with AdBlue®:

- Pour copious amounts of water over the eyes immediately.
- Rinse eyes thoroughly by keeping eyes open and eyelids away from eyes.
- Continue to rinse the eyes with fresh running water for at least fifteen minutes.
- Removal of contact lenses after an eye injury must be undertaken by trained personnel.
- Seek medical advice if irritation continues.

Skin contact (burns)

If the skin has come into contact with AdBlue®:

- Immediately cool affected skin with cold water over the affected area.
- Carefully remove all clothing which has been in contact with AdBlue®.
- Continue to rinse the affected area with ample water for at least fifteen minutes.
- Apply antiseptic bandages to the affected areas.
- Seek medical advice if irritation continues.

Inhalation (of AdBlue® liquid/ammonia/biuret)

Do NOT enter the danger zone without adequate protection including respiratory mask and/or aforementioned protective clothing. If any toxic fumes have been inhaled:

- If possible, remove the person out of the contaminated area into fresh air.
- Lay the person down and loosen their clothing, keep warm and rested.
- If the person is unconscious, place them in the recovery position.
- If necessary, trained personnel should apply oxygen or artificial respiration to the person.
- Call for medical assistance if breathing difficulties continue.

Ingestion

If AdBlue® liquid has been ingested:

- Do NOT induce vomiting.
- If vomiting occurs, lean person forward to maintain open airway and prevent aspiration.
- Rinse out mouth with water before trying to ingest a comfortable amount.
- Seek medical advice if large amounts have been ingested or if irritation continues.

0.5.6. STORAGE OF ADBLUE®

- AdBlue® liquid will crystallize at low temperatures; at elevated temperatures (above 50°C) it can form biuret and ammonia. Always store AdBlue® liquid away from sources of heat or fire in AdBlue® compatible containers in segregated, approved and labeled areas.
- Store away from incompatible materials and avoid contact with strong oxidizers, acids, alkalis, nitrates, sodium or calcium hypochlorite which can react with AdBlue® to form a potentially explosive mixture. Do not store for long periods (over six months).
- Ensure the container is securely sealed, protected against physical damage and checked regularly for leaks. If a third party tank/container for the supply of AdBlue® is installed on the service station, refer to the manufacturer's recommendations for filling, emptying, cleaning, handling and storage of the tank/container unit.

0.5.7. SPILLAGE OF ADBLUE®

Although classified as non-hazardous, AdBlue® liquid, when spilt, will form crystals and creep. If left unattended, this will create a slippery surface. All spillages of AdBlue® liquid must be reported immediately to the Station Manager.

Avoid breathing vapors and contact with skin and eyes by use of personal protective equipment.

AdBlue® spillage on forecourt:

- Liberally cover the spillage with sand, earth or other inert, absorbent material.
- For larger spills, contain the spill with sand or earth and prevent spillage from entering drains or surface waterways.

NOTE

Do not release AdBlue® into surface water and do not empty into drains!

- When dry, transfer into a suitable container for controlled disposal.
- If AdBlue ® is leaked into the drainage system, flush liberally with plenty of water.
- Apply prevailing national/local regulations for waste disposal.

AdBlue® in dispenser/vehicle:

- Use a soft cloth and water to remove small AdBlue® spillages on the dispenser/vehicle.

WARNING

RISK OF ELECTRICAL SHOCK - NEVER USE A HOSE OR HIGH PRESSURE SPRAY NEAR THE ADBLUE® DISPENSER

1. TATSUNO ADBLUE® DISPENSERS

1.1. BASIC SPECIFICATIONS

Dispensed medium		AdBlue®, 32.5% solution of urea in water
Max. flow rate	Q_{max}	40 L.min^{-1}
Min. flow rate	Q_{min}	4 L.min^{-1}
Min. volume of refueling	V_{min} (MMQ)	2 L
Cyclic volume	V_c	0.5 dm^3
Max. operating pressure	P_{max}	0.4 MPa (4 bar)
Accuracy of dispensing		0.5
Operating temperature of the ambient air		-25 ~ +55°C (-40 ~ +50°C with additional heating)

Electronic counter:

Power		~230 V; +10% -15%; 50 Hz ± 5 Hz max. 150 VA
Electromagnetic valves		+24V DC; 12W (max. 17W)

Displays:

a) 7-segment LCD displays with LED backlight (type PDEDIL)

	volume	0.01 to 9999.99 L
	amount	1 to 999999 currency units
	unit price	1 to 9999 currency units/dm^3
character height	volume	2.54 mm
	amount	2.54 mm
	unit price	2.54 mm

b) Graphic proportional LCD displays with LED backlight (type PDEDCU)

	volume	0.01 to 99999.99 L
	amount	1 to 99999999 currency units
	unit price	1 to 999999 currency units/1L
character height	volume	30 mm
	amount	30 mm
	unit price	30 mm

Electromechanical volume totalizer	0000000 to 9999999 L

1.2. ADBLUE® DISPENSER DESCRIPTION

The AdBlue® dispensers TATSUNO, version OCEAN, have the body parts (guards, doors, covers…) made of lacquered steel sheet and fireproof laminate (reinforced plastic) approved for the scope of use by the State Test Laboratory (Certificate of FTZÚ 04ST 0083). Supporting dispenser skeleton parts are made of lacquered steel sheet and/or of stainless sheet. The standard color version of the AdBlue® dispensers TATSUNO is white (RAL9016) with a black dispenser base (RAL9005)**.** Each AdBlue® dispenser is equipped by a piston flow meter of the Japanese company TATSUNO. This is a time-tested type of meter known globally for its high reliability and long total service life. The dispenser comprises the hydraulics box, hose retractor column and counter and electronics box. The counter box is equipped with masks with locks. The masks include dials with display screens. The TATSUNO pulse generator is installed on the piston meter. The measuring unit consists of the meter itself, a filter and a controlling electromagnetic valve. The dispensed medium passes through the filter, meter and controlling valve, is led into the hose and through the sight glass via the nozzle it is transported into the AdBlue® tank of the vehicle.

The **rotary four-piston meter** is of horizontal design with a vertical crankshaft. The liquid enters the top meter part and is distributed to each piston by a rotary valve affixed to the crankshaft. The pistons move under pressure in cylinders and this motion is converted into rotary motion (one shaft revolution = 0.5 dm^3). The opto-electronic **pulse generator** registers the motion and converts it into electric pulses which are processed by the electronic counter. The measured liquid is led away via a rotary slide valve and a crankcase. The meter is calibrated by the adjusting handwheel on the cylinder cover. Measure error can be eliminated by adjusting the piston stroke. When swiveling the wheel clockwise, the delivered volume will be decreased and vice versa (by swiveling counterclockwise the delivered volume is increased). One wheel division represents a change of 0.08% of the delivered volume. The flow meter accuracy can be set to within ±0.25% for the complete range of flow rates.

The electronic register processes pulses from the pulse generator and transmits them to the displays (LCD or FP), where the dispensed volume, price and volume unit price is displayed. In case of power failure the data are saved in the memory and displayed on the displays for a minimum of 15 minutes.

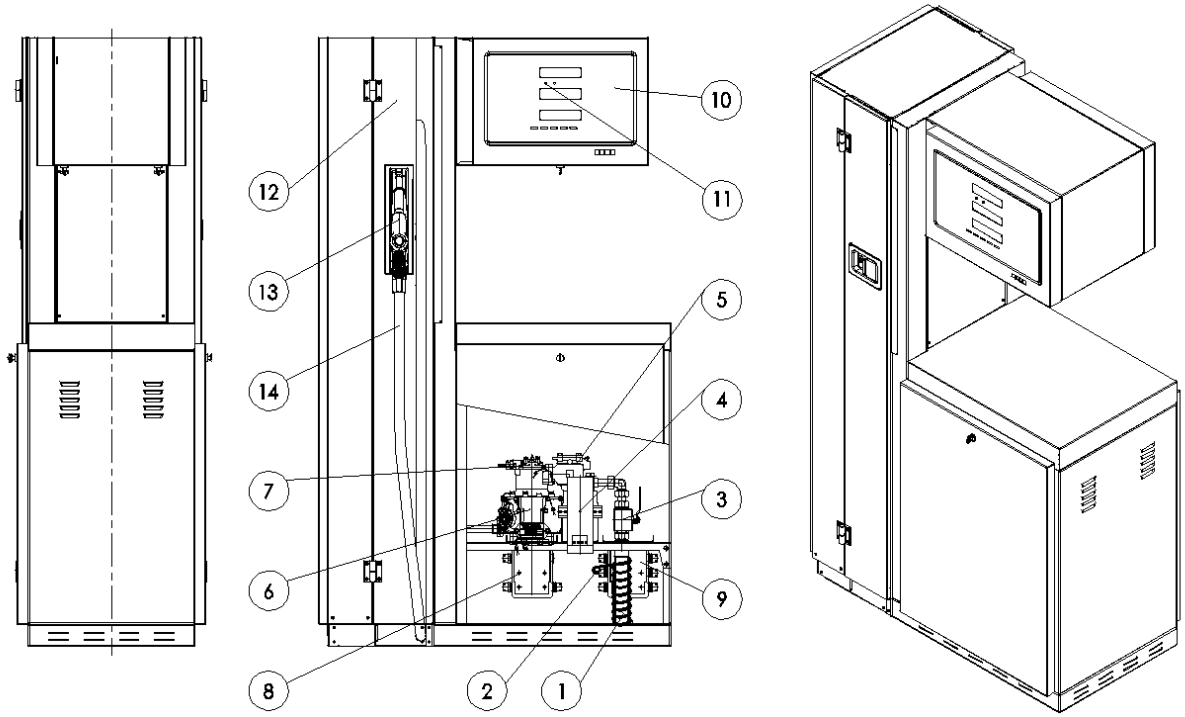
The AdBlue® dispenser is equipped by an electronic counter type PDEX or TBELTX as a standard. AdBlue® dispensers can be operated independently in the **manual mode**, or connected via a communication line to the cash desk (POS) system of the filling station.

Pre-selection

All AdBlue® dispensers can be equipped with special electromagnetic deceleration valves, guaranteeing precise price and quantity pre-selection via a clearly arranged 4-key keyboard, enabling price or volume pre-selection by the customer directly on the AdBlue® dispenser.

Special Color Version

In addition to the standard white AdBlue® dispenser version, the products can be delivered in any color version at the customer's wish (colors pursuant to RAL, CSN, Colorlak scale or a specially prepared color). The special color is delivered at an extra charge, which depends on the type and shade of the requested color.



Pos.	Description	Pos.	Description
1	Input Flexible Pipe With Flange	8	Data Line Distribution Box
2	Cable for Heating of Input Pipe	9	Power Distribution Box
3	Spherical Valve	10	Counter Case with Display
4	Heating unit with ventilator and thermostat	11	IR Receiver (for Remote Controller PDERT)
5	Filter	12	Nozzle Boot and Hose Cover (Door)
6	AdBlue® piston meter TATSUNO FM-1022	13	AdBlue® Nozzle
7	Pulser TATSUNO EK-1025	14	AdBlue® Hose

Fig. 1 – Main Parts of AdBlue® Dispenser

1.3. SURVEY OF AVAILABLE MODELS

The following paragraph explains the marking (coding) system of the fuel dispensers OCEAN AdBlue®.

The commercial marking of the dispensers has the following basic form:

BMP401x.OEy/AdB

wherein

x... is a number from 1 to 2 defining the total number of nozzles or hoses
y... is one of letters D, R and L defining the orientation of the dispenser in relation to the refuge island of the petrol station in the direction of vehicle arrival:

D … (double) double-sided dispenser,
R … (right) single sided right-oriented dispenser,
L … (left) single sided left-oriented dispenser.

The dispenser code always contains the **BMP** abbreviation, which denotes all fuel dispensers from the company TATSUNO EUROPE. Following are the two digits "**40**" denoting the type series BMP**40**00.O. The next number "**1**" shows the number of pump/hydraulic units in the dispenser (or the number of products). In the case of AdBlue® dispensers, this is always 1. The number "**x**" defines the total number of hoses in the dispenser. Then there is a full stop and the two letter abbreviation "**OE**" meaning the **O**CEAN **E**URO design model of the dispenser. The last symbol "**y**" marks the orientation of the fuel dispenser from the direction of vehicle arrival to the dispenser.

1.3.1. ADDITIONAL ABBREVIATIONS IN THE DISPENSER MARKING

There may be additional abbreviations after the basic dispenser code:

Abbreviation	Description
/CUBE, /FIN, /WAVE	Decorative elements for dispenser in basic model
/LON, /DART, /LOG	Data line with the interface IFSF-LON, DART or Logitron PUMALAN
/ER4, /TATPL, /ATCL	Data line with the interface Kienzle ER4, TATSUNO Party Line or Autotank ATCL
/TA2331	Outlet of pulses, nozzle and RELEASE signals to connect to Tankautomat TA2331
/ALX	Outlet of pulses and nozzle signal to connect to the terminal ALX (ALX-308)
-C1x	LED site number, 1 digit (0 to 9), x is a colour (č-red, b-white, ž-yellow, z-green)
-C2xx	LED site number, 2 digits (10 through 29), x is a colour (č-red, b-white, z-green)

1.3.2. BASIC MODELS OF ADBLUE® DISPENSERS

Dispenser Type	Number of Pump Sites	Number of Hoses	Number of Displays	Dispensing Output [L/min]
BMP4011.OEL /AdB*	1	1	1	40
BMP4011.OER /AdB*	1	1	1	40
BMP2012.OED /AdB*	2	2	2	2x 40

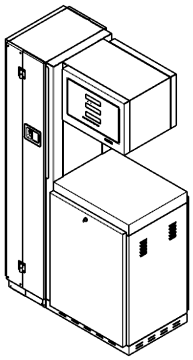
** the table is identical for variations /WAVE, /FIN and /CUBE*

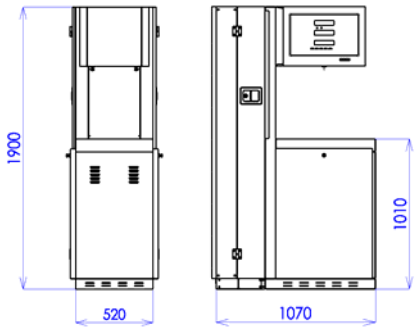
1.3.3. DIMENSIONS & WEIGHTS

Dispenser Type	Height [mm]	Width [mm]	Length [mm]	Weight [kg]
BMP4011.OEL /AdB	1900	520	1070	160
BMP4011.OER /AdB				
BMP4012.OED /AdB				210
BMP4011.OEL /AdB/WAVE	2160			166
BMP4011.OER /AdB/WAVE				
BMP4012.OED /AdB/WAVE				216
BMP4011.OEL /AdB/CUBE	2156			165
BMP4011.OER /AdB/CUBE				
BMP4012.OED /AdB/CUBE				215
BMP4011.OEL /AdB/FIN	2156			165
BMP4011.OER /AdB/FIN				
BMP4012.OED /AdB/FIN				215

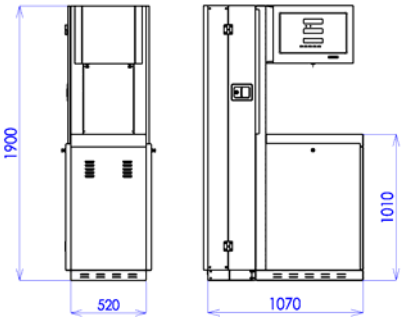
1.3.4. ADBLUE® DISPENSER FIGURES

Basic Version
(BASE)

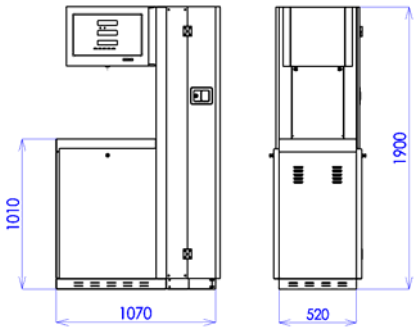




OCEAN BMP4012.OED /AdB (Two-Side Dispenser)

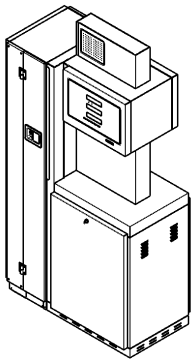


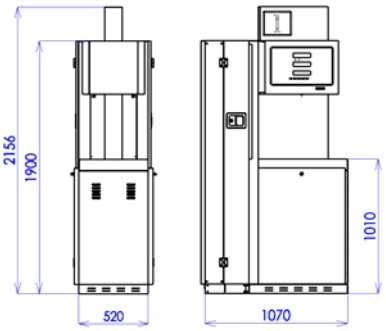
OCEAN BMP4011.OEL /AdB (One-Side Dispenser - Left)



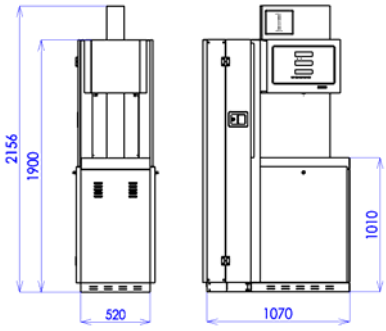
OCEAN BMP4011.OER /AdB (One-Side Dispenser - Right)

Version CUBE

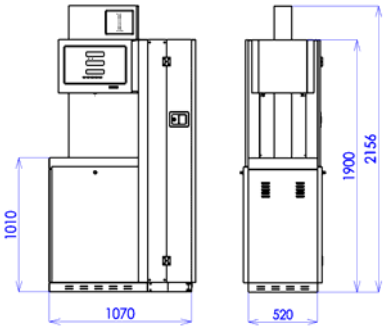




OCEAN BMP4012.OED /AdB/CUBE (Two-Side Dispenser)

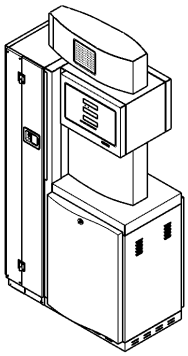


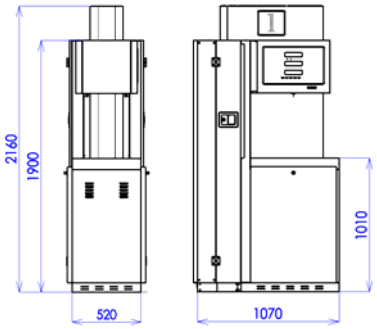
OCEAN BMP4011.OEL /AdB/CUBE (One-Side Dispenser - Left)



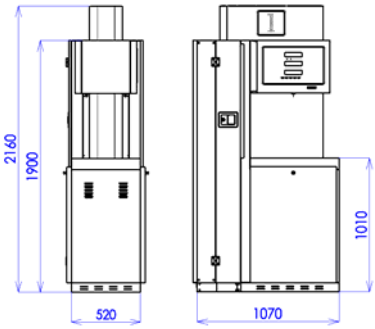
OCEAN BMP4011.OER /AdB/CUBE (One-Side Dispenser - Right)

Version WAVE

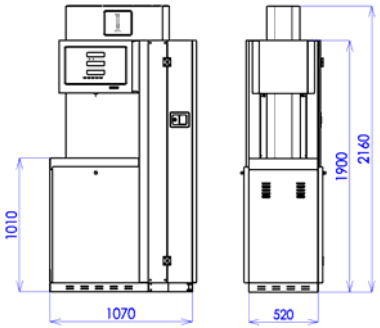




OCEAN BMP4012.OED /AdB/WAVE (Two-Side Dispenser)

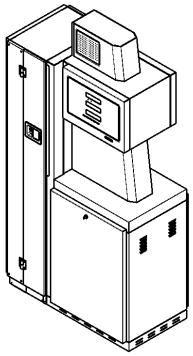


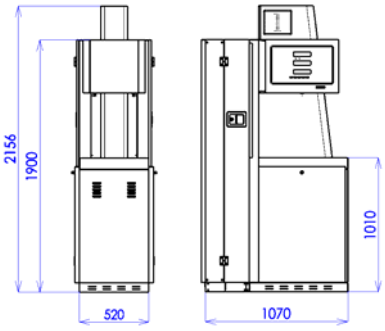
OCEAN BMP4011.OEL /AdB/WAVE (One-Side Dispenser - Left)



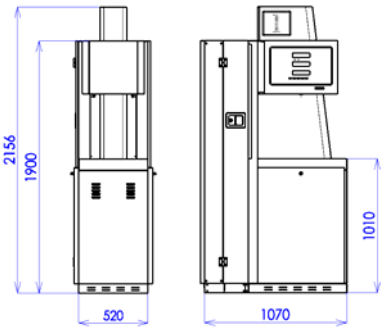
OCEAN BMP4011.OER /AdB/WAVE (One-Side Dispenser - Right)

Version FIN

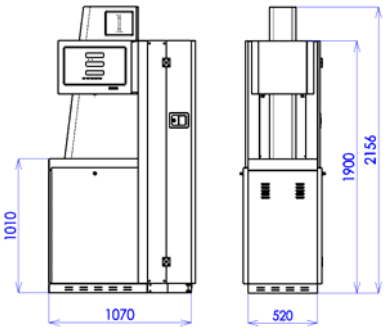




OCEAN BMP4012.OED /AdB/FIN (Two-Side Dispenser)



OCEAN BMP4011.OEL /AdB/FIN (One-Side Dispenser - Left)



OCEAN BMP4011.OER /AdB/FIN (One-Side Dispenser - Right)

2. INSTALLATION

2.1. INSTRUCTIONS FOR SAFE WORK

CAUTION

- **This appliance may only be installed by qualified authorized staff in compliance with relevant norms, directives and local limitations and according to this manual.**
- **In the immediate vicinity of the dispenser it is forbidden to smoke or use open fire.**
- **Always follow the procedures set for manipulation with AdBlue®.**
- **Monitor any leakage in the dispenser. In case of AdBlue® leakage, disconnect the power supply and contact the service company (see section 5).**
- **Electric installation must be performed by qualified experts.**
- **Make sure that a properly working fire extinguisher is available in the vicinity of the dispenser.**
- **When manipulating with the dispenser, use proper protection aids.**

2.2. RECEIPT, TRANSPORT, UNPACKING

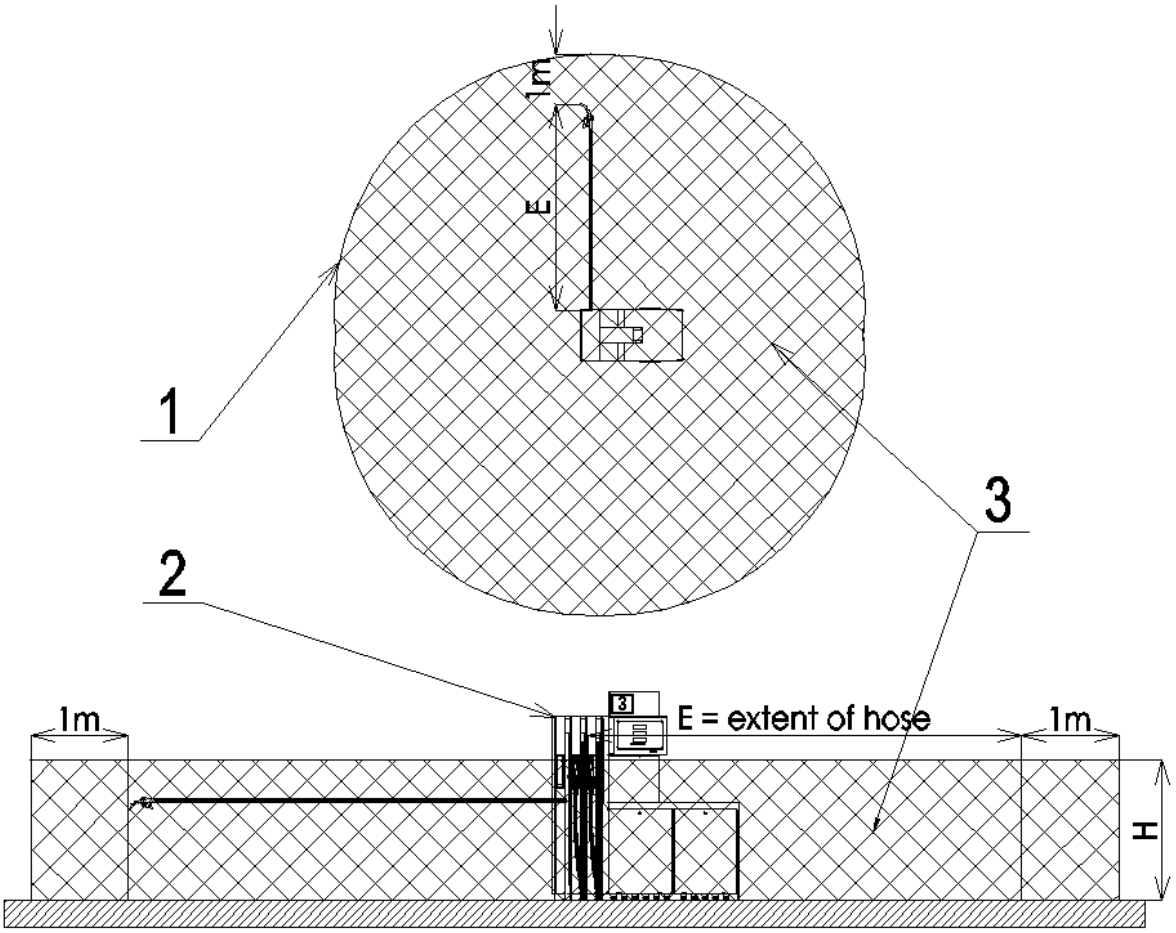
The customer will conclude a contract with the producer to organise the dispenser delivery. If the delivery is to be ensured by the company TATSUNO EUROPE a.s., they will transport the product to the agreed location. The producer has sufficient knowledge of correct procedures for manipulation and transportation. If the delivery is to be ensured by the customer in a different way, the producer will only ensure professional loading, but will not be responsible for the transport. In general, the dispenser must be transported properly packed and fixed to the frame. Inside the transportation vehicle the dispenser must be secured against damage (covers, paints), motion and tipping. Manipulation and transport must always be done in a vertical position; the dispenser must not be placed on its covers.

WARNING

During manipulation, only fork-lift trucks are allowed to be used. If a different manipulation method is used, TATSUNO EUROPE a.s. does not provide warranty for any damage!

2.3. ADBLUE® DISPENSER INSTALLATION AND LAYOUT

TATSUNO AdBlue® dispensers do not create hazardous areas (potentially explosive atmospheres) and therefore there are no zone diagrams required for these dispensers. TATSUNO AdBlue® dispensers do not have ATEX certification and thus may NOT be installed in hazardous zones 1 or 2 of service stations. The following zone diagram (see Fig. 2) is a recommendation for the installation of dispensers without ATEX certification on service stations where petrol dispensers are present.



Pos.	Description	Pos.	Description
1	Plan view (not to scale)	E	Extent of hose of the Petrol/Diesel dispenser
2	Front elevation (not to scale)	H	Height of vapor barrier
3	Restricted area (AdBlue® dispensers without ATEX certification may not be installed within this space)		

Fig. 2 – Restricted area for AdBlue® dispensers

NOTE

The diagram is a guideline only and all local and/or national prevailing regulations must be observed at all times.

ATTENTION

*AdBlue® dispensers **may not** be placed in the dangerous zone. Electronic counters used in these dispensers are uncased, placed in the explosion-protected zone and separated from all other zones by a partition of type 1 according to EN 13617-1.*

2.4. MECHANICAL MOUNTING OF ADBLUE® DISPENSER

The AdBlue® dispensers are fixed to special foundation frames by anchor bolts delivered along with the dispenser. The foundation frame is outside the scope of standard dispenser equipment, but can be ordered additionally. The foundation frame is seated into the concrete on the island, then the front and rear dispenser casings are removed, the dispenser is placed on the foundation frame and fixed by fixing screws.

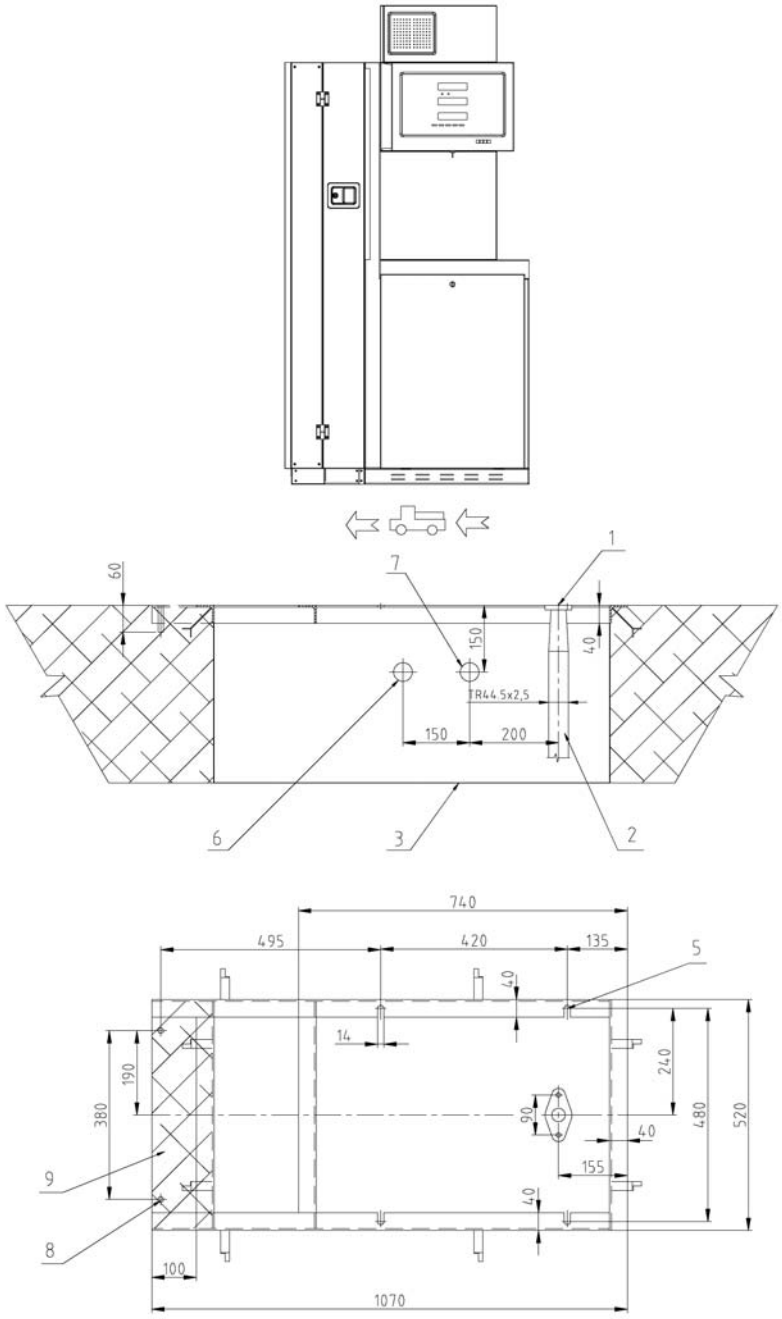
CAUTION

For safety and environmental protection reasons, it is essential to install a leakage container under the dispenser to prevent leakage and escape of the AdBlue® medium.

Following this, the dispenser is connected to the suction pipe using the flexible pipe included in the delivered equipment. Fig. 3 shows the base plan of OCEAN AdBlue® dispensers with the input pressure pipe location marked.

WARNING

All installation pipe work and fittings must be manufactured from AdBlue® compatible materials. Galvanized steel is not suitable!



Pos.	Description	Pos.	Description
1	Oval connecting flange 1 ¼" (ČSN 13 1365)	7	Output for electric cables of data line
2	Input pressure pipe Axis	8	2 x fastener for concrete Ø12
3	Leakage container	9	This surface must be on level with the base frame!
5	Anchoring openings	⇦	Recommended arrival direction of vehicles to the dispenser
6	Output of electric cables for dispenser feeding		

Fig. 3 – Base plan of OCEAN AdBlue® dispenser

2.5. ADBLUE® DISPENSER WIRING

Electric wiring of the OCEAN fuel dispensers requires protection against contact voltage (according to the norm ČSN 33 2000-4-41 "Electro-Technical Regulations - Electrical Equipment - Part 4: Safety - Chapter 41: Protection against electrical shock", published: August 2007, which complies with the international norm HD 60364-4-41:2007) and it requires that appropriate electrical cables must be led to each dispenser.

It is necessary that all fuel dispensers at the station be interconnected with a grounding conductor and connected to a grounding system. A green-yellow conductor of at least a **4 mm^2** cross section or a special flat conductor can be used as the grounding conductor. The grounding conductor must be connected to a central grounding clamp of the fuel dispenser located in its base (bolt M10), identified with a grounding mark.

ATTENTION

All electrical cables must have good insulating properties, because they are subject to an aggressive environment for a long time period. For these purposes the manufacturer recommends harmonized cable types, for example H05VV5-F (power) and H05VVC4V5-K (shielded - data).

NOTE

Ends of all cables entering the AdBlue® dispenser must be long enough to facilitate installation (cables are terminated in the junction box) – each cable must end at least **3 m** above the ground.

Regarding applied voltage and function, the cables can be broken down to power (supply) and data (signal) cables.

Power cables:

- Switching of AdBlue® submersible pump
- Feeding of counter, switches (valves) and heating of hydraulic components of the dispenser

Data cables:

- Data line
- Service line

2.5.1. SWITCHING OF ADBLUE® SUBMERSIBLE PUMP

The switching of the AdBlue® submersible pump motor is carried out by a **3-core cable**, for example H05VV5-F 3G x 2.5. The cable is connected from the main technological switchboard in the kiosk to the power switchboard of the AdBlue® dispenser, see Fig. 6. In the main technological switchboard, the switch circuit must be protected by an independent current breaker 230V/6A with characteristics shown in Fig. 5.

Marking of conductors in cable H05VV5-F 3G x 2.5		
Marking	Color	Description
SL	Black	Switching phase of submersible pump
SN	Blue	Switching voltage (max. 250V/1A)
PE	Green-Yellow	Protective Conductor

Fig. 1 – Cable for switching of AdBlue® submersible pump

NOTE

Relay or motor contactors are used in AdBlue® dispensers for switching the submersible pump on or off. The switching voltage on the contacts should not exceed the value of 250V and the switching current the value of 1A.

2.5.2. FEEDING OF ELECTRONIC COUNTER, SWITCHING ELEMENTS AND HEATING

The feeding of the counter, switching elements and heating is carried out by a 5-**core cable**, for example H05VV5-F 5G x 2.5. The cable is led from the main technological switchboard of the station independently into the AdBlue® power switchbox, see Fig. 6. In the main technological switchboard, the feeding and heating must be connected to phase through an independent circuit breaker of 230V/6A with characteristics B, see Fig. 5.

Marking of conductors in cable H05VV5-F 3G x 2.5		
Marking	Color	Description
Ls	Black	Phase wire of stabilized counter feeding
Ns	Blue	Neutral wire of counter feeding
Lt	Brown	Phase wire of heating feeding
Nt	Blue	Neutral wire of heating feeding
PE	Green-Yellow	Protective conductor

Table 2 – Feeding cable of electronic counter, switching elements and heating

2.5.3. DATA (COMMUNICATION) LINE

The data line serves for remote AdBlue® dispenser controlling and data transfer in the so called automatic mode. The dispenser is controlled remotely by a single-purpose console, station controller or directly by the computer located in the kiosk of the service station. The line need not be installed if the dispenser is operated in the manual mode only.

For the installation of the data line, it is necessary to connect a shielded communication cable H05VVC4V5-K 5G0.5 to each dispenser on the site, see Table 3. The data line must lead radially from the station controlling point (kiosk, control panel) to the first module of every dispenser into the communication switchboard, see Fig. 7. From the communication switchboard, the data line is led via the H05VVC4V5-K 5G0.5 cable into the head of the electronics of the dispenser and connected to the electronic counter.

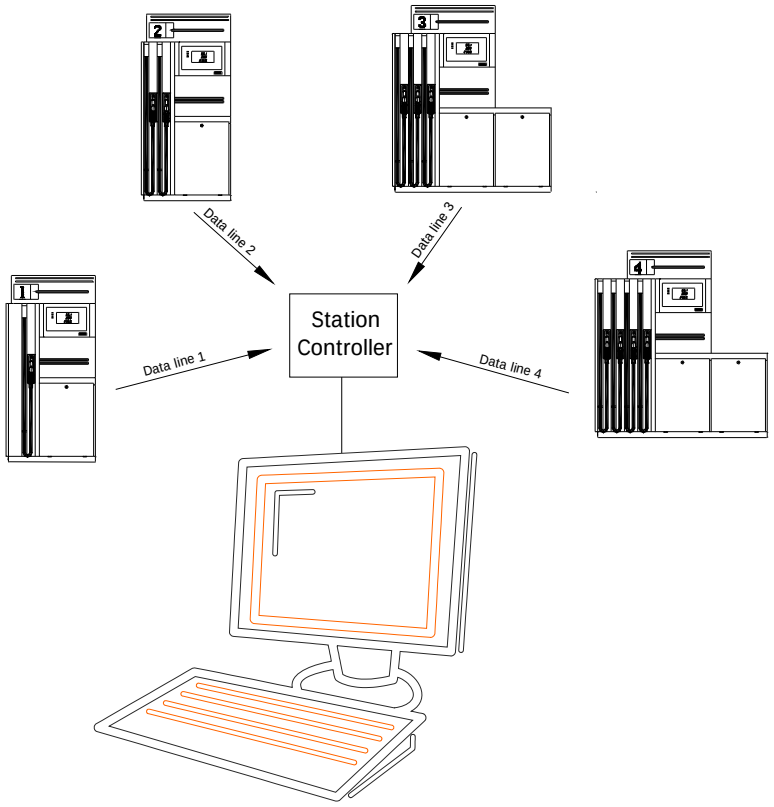


Fig. 4 – Radial connection of data lines from dispensers

Markings of conductors in cable H05VVC4V5-K 5G0.5		
Marking	Colors	Description
A	Black1	Data A
B	Black2	Data B
-	Black3	Reserved
-	Black4	Reserved
	Green-Yellow	do not use
ST	shielding	shielding

Table 3 – Markings of conductors in PDE data line

ATTENTION

For the communication line at least a **four-core shielded communication cable with a minimum cross section of 0.5 mm^2** must be used. The cover of the cable must be flame retardant and resistant to AdBlue®.

As a standard, OCEAN AdBlue® dispensers are equipped with a PDE data line, which is an RS485 line with a PDE communication protocol. At the customer's request we can complement the dispenser's counter with a data converter, which converts the PDE data line to a different type of line with a different communication protocol, such as PUMA LAN, ER4, IFSF-LON, TATSUNO Party Line etc. This will also

change the roles of the individual conductors in the data cable. Marking of the conductors in the most used data line types is stated in Table 4.

Marking of conductors in H05VVC4V5-K 5G0.5 cable for different types of data lines							
Conductor color	**PDE**	Easy Call	PUMA LAN	PUMA LAN + probes	ER4	DART	ACTL
Black1	**A**	D(-)	TX	TX	YA	A	Tx+
Black2	**B**	D(+)	RX	RX	ZA	B	Tx-
Black3	**-**	0V	AM	GND	YB	-	Rx+
Black4	**-**	Reserved	0V	LL0	ZB	-	Rx-
Green-Yellow	**Unused**	Unused	Unused	LL1	Unused	Unused	Unused
Shielding	**ST**	ST	ST	ST	ST	ST	ST

Table 4 – Marking of conductors for different types of data lines

2.5.4. SERVICE LINES

Service lines are for special purposes. These lines are not indispensable for the operation of the dispenser per se, but they are used in situations when selected functions of the dispensers need to be controlled remotely, or when signals from the dispenser need to be transmitted. Always consult the technicians of TATSUNO EUROPE a.s. whether service line installation is necessary. For service lines we recommend using multi-core shielded cables type H05VVC4V5-K (0,5 mm^2).

2.5.5. CABLE CHARACTERISTICS

For the installation, cables resistant to common chemicals, oils and with a sufficient thermal and mechanical resistance must be used. These conditions are satisfied for instance by H05VV5-F and H05VVC4V5-K harmonized cables. The main characteristics of the cables are listed in Table 5.

Cable type	Function	Number of cores	D_{Anom} [mm]
H05VV5-F 3G2,5	Switching of submersible pump in tank	3	9.6
H05VV5-F 5G2,5	Feeding of counter and heating of hydraulic part	5	11.6
H05VVC4V5-K 5G0,5	Data line	5	10.1

Legend: D_{Anom} – cable outer diameter

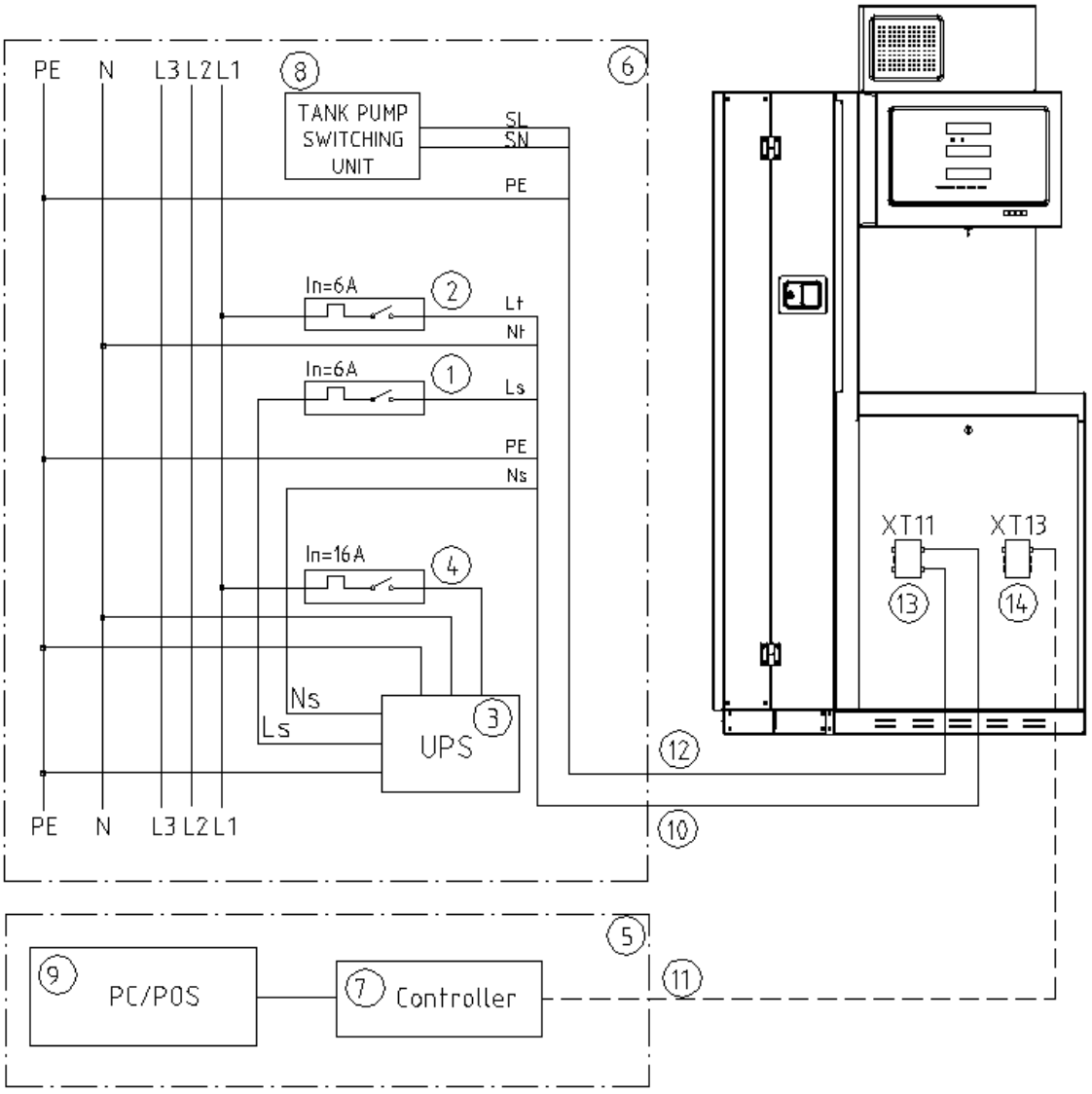
Table 5 – Characteristics of cables

NOTICE

Impulse surges can form in any conductor, when lightning strikes within a distance of up to several kilometers, or due to industrial activities. The strength of the impulses due to induction from lightning is enough to completely destroy an electronic apparatus. For this reason surge protection is used, which leads the overvoltage impulse energy into a grounding conductor and thus protects electric appliances. The producer of the dispensers ***recommends*** *protecting the main distributor (and the secondary distributor where applicable) that supplies the dispensers, electronic equipment (computer, cash desk etc.) and data lines with overvoltage protectors and lightning arresters.* ***The producer does not provide any warranty for damage caused due to insufficient protection of cables!***

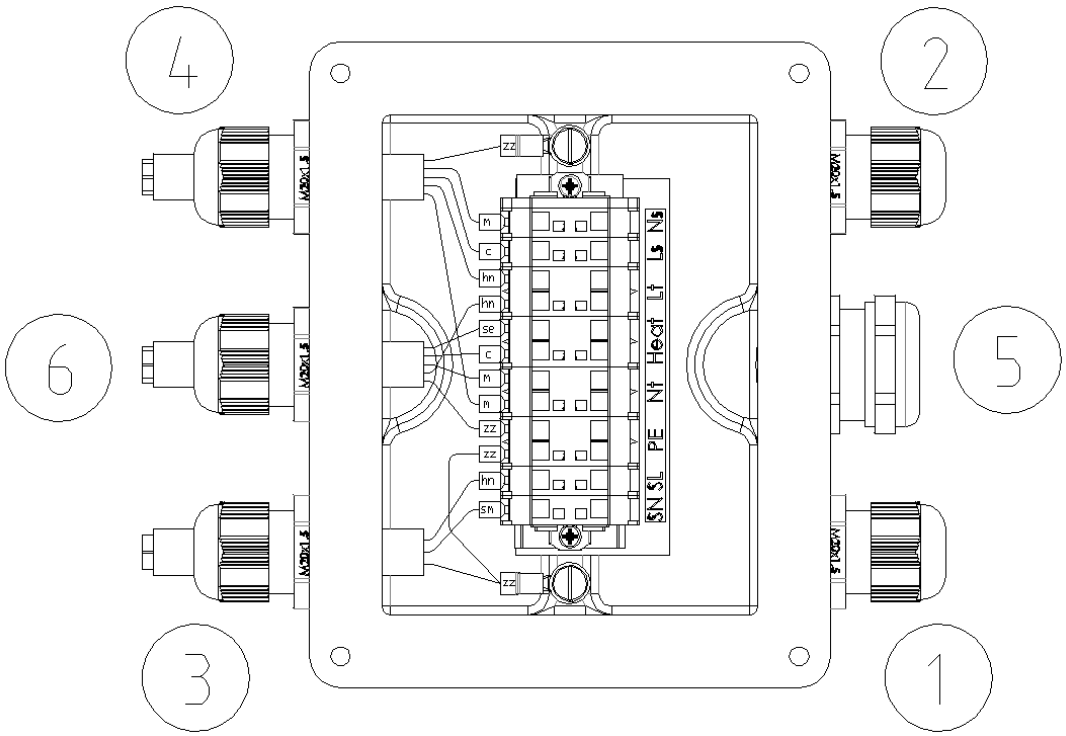
NOTICE

For trouble free operation of the fuel dispensers it is ***necessary*** *to separate the signal cables from the power supply cables. If there are power cables near the signal cables, interference forms, which may cause problems with the control of the dispensers or even destroy the electronic appliances installed in the dispensers and in the kiosk. Any crossing or joint installation (in a single cluster) of signal and power cables must thus be avoided. The issue can be solved by putting signal cables and power cables into their own independent "channels" (metal pipes).* ***The producer does not provide any warranty for damage caused due by improperly solved cable connections!***



Pos.	Description	Pos.	Description
1	Circuit breaker for counter feeding - In=6A	8	Unit for switching of fuel pumps
2	Circuit breaker for feeding of hydraulics - In=6A	9	Control device (PC, cash desk, POS, console)
3	UPS backup source with feeding stabilization	10	Cable for feeding of counter and heating - H05VV5-F 5G2,5
4	Circuit breaker of UPS backup source	11	Communication line - H05VVC4V5-K 5G0,5
5	Operator workplace (kiosk)	12	Cable for switching of submersible pump - H05VV5-F 3G2,5
6	Main switchboard of station dispensing technology	13	Feeding switchboard XT11
7	Data converter (RS485 / RS232) or controller	14	Data distribution box XT13

Fig. 5 – Example of wiring of OCEAN AdBlue® dispenser



Input

1	**Power cable for submersible pump switching** Type: H05VV5-F 3G2,5 (recommended) Wiring: main distribution box <---> XT11	
SL	switching phase	brown (hn)
SN	neutral wire	blue (sm)
PE	protective conductor	green-yellow (zz)

2	**Power cable for counter feeding** Type: H05VV5-F 5G2,5 (recommended) Wiring: main distribution box <---> XT11	
Ns	neutral wire of counter feeding	blue (m)
Ls	phase wire of counter feeding	black (c)
Nt	neutral wire of heating feeding	blue (m)
Lt	phase wire of heating feeding	brown (hn)
PE	protective conductor	green-yellow (zz)

6	**Input and output of thermostat** Type: H05VV5-F 5G1,5 Wiring: thermostat of dispenser hydraulics <---> XT11	
Nt	neutral wire of heating feeding	blue (m)
Lt	phase wire for heating feeding	brown (hn)
Heat	phase wire of heating cable	black (c)
Heat	phase wire of heating cable	gray (se)
PE	protective conductor	green-yellow (zz)

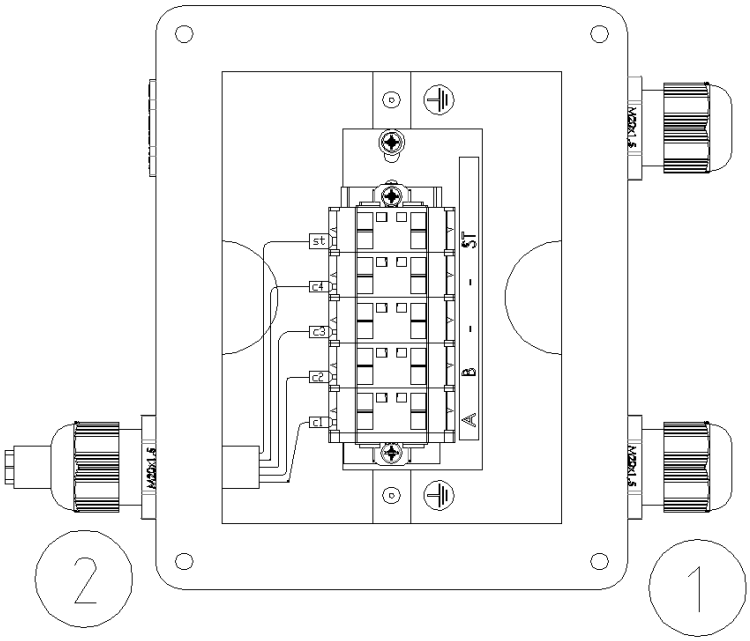
Output

3	**Power cable for submersible pump switching** Type: H05VV5-F 3G1,5 Wiring: XT11 <---> dispenser counter case	
SL	switching phase	brown (hn)
SN	neutral wire	blue (sm)
PE	protective conductor	green-yellow (zz)

4	**Power cable for counter feeding** Type: H05VV5-F 5G1,5 Wiring: XT11 <---> dispenser counter case	
Ns	neutral wire of counter feeding	blue (m)
Ls	phase wire of counter feeding	black (c)
Nt	neutral wire of heating feeding	blue (m)
Lt	phase wire of heating feeding	brown (hn)
PE	protective conductor	green-yellow (zz)

5	**Heating cable** Type: H05VV5-F 5G1,5 Wiring: XT11 <---> heating cable	
Heat	phase wire of heating cable	black (c)
Nt	neutral conductor of heating cable	black (c)

Fig. 6 – Wiring of feeding distribution box XT11



Input

1	**Communication cable for data line** Type: H05VVC4V5-K 5G0,5 (recommended) Wiring: kiosk <---> XT13	
1	signal 1	black1 (c1)
2	signal 2	black2 (c3)
3	signal 3	black3 (c3)
4	signal 4	black4 (c4)
5	shielding	shielding (ST)

Output

2	**Communication cable for data line** Type: H05VVC4V5-K 5G0,5 Wiring: XT13 <---> dispenser counter case	
1	signal 1	black1 (c1)
2	signal 2	black2 (c3)
3	signal 3	black3 (c3)
4	signal 4	black4 (c4)
5	shielding	shielding (ST)

Fig. 7 – Data line wiring of distribution box XT13

Description (protocols and devices)	**/PDE** (standard PDE, DART, IFSF-LON)	/PUMA LAN (PUMA MPD, PUMAFIT,HT-TE)	/ER4 (Hectronic Kienzle, ER4, TA2331)	/EASYLINE (Beta Control, ADP, ADPMPD)	/AUTOTANK (AUTOTANK)	/DATECS (POS DATECS)
signal 1	**A**	TX	YA	D(-)	RCL+	I11
signal 2	**B**	RX	ZA	D(+)	RCL-	I12
signal 3	-	AM	YB	0V	TCL+	I13
signal 4	-	0V	ZB	-	TCL-	I14
shielding	**ST**	ST	ST	ST	ST	ST

Table 6 – Description of signals on connector of data distribution box by type of communication protocol

NOTE

Distribution boxes RK003/6 and RK002/6 are of the models Ex II 2G Ex e II T6 Gb and are issued with European type certificates FTZÚ12ATEX0152 and FTZÚ02ATEX0021. The maximum load of one connecting clamp is 2A/550V with a conductor cross-section of 0.5 mm^2 or 12A/550V with a cross-section of 2.5 mm^2. The allowed cross-sections of conductors are between 0.5 and 2.5 mm^2. The length of the uninsulated part of the conductor is min. 9 mm and max. 10 mm. Cable glands M12 x 1.5, M16 x 1.5 or M20 x 1.5 are in the models IP66/68. The description of the box conductor depends on the data line type. A data line with the PDE protocol is used as a standard.

3. BASIC FUNCTIONS AND DISPENSER SETTING

Setting of the AdBlue® dispensers is done by a set of parameters, by which functional dispenser parameters, modes and behaviors in different situations are controlled. Values of the parameters can be monitored and changed either by a remote IR controller (with the PDEX counter), or by the functional keys placed directly on the dispenser display, or via a simple 4-key keyboard (with the TBELTx counter).

Methods of setting the AdBlue® dispenser differ and depend on the type of the counter placed in the dispenser head. The next section describes basic functions and setting for the counters PDEX and TBELTx.

3.1. PDEX COUNTER

The electronic counter PDEX, manufactured by the company TATSUNO EUROPE a.s., is set by the remote IR controller. For white remote controller PDERT-xO for managers of service stations facilitates the following operations:

- displaying of non-resettable electronic volume totalizers of all hoses
- displaying and reset of daily electronic volume and cash amount totalizers of all hoses
- setting of product unit prices (manual mode)
- displaying and setting of functional parameters of the dispenser

The setting mode can be started by the method described below provided the dispenser is idle - dispensing completed, all nozzles deposited in boots, all transactions completed). There are two setting modes available:

- ***Operator mode***, which is specified for the attendant of the service station – the operator can only read values of electronic totalizers and values of basic dispenser parameters. The operator can neither reset nor change their values.
- ***Manager mode,*** which is specified for the manager of the service station – the manager is authorized to read dispenser values, as well as to reset daily totalizers and to set basic operating parameters of the AdBlue® dispenser. Access to the Manager mode is protected by an access password.

3.1.1. PDERT REMOTE CONTROLLER DESCRIPTION

A special remote IR controller must be used for reading dispenser (totalizer) values, changing the dispenser mode or setting different counter parameters on dispensers equipped with the PDEX counter. The remote controller keyboard has the following keys and their layout (see Fig. 8):

Fig. 8 – Description of keys on remote controller PDERT-4O

When using the IR remote controller, the controller must be approx. 1 meter from the centre of the fuel dispenser display – see Figure 17. The setup mode is triggered by the <R> key (manager mode), or by consequent pushing of the keys <S> and <R> (operator mode). The values to be set or read are shown in the display. During reading of the electronic totalizers, there apply the dispenser parts marking rules described in chapter 2.4.2. and shown in the Figure 17.

When using the IR remote controller, it is necessary to maintain a distance of approx. 1 meter from the center of the dispenser display, as shown in Fig. 9. The setup mode is triggered by the <R> key (manager mode) or by <S> followed by <R> (operator mode). The set and read values are shown on the display. During the reading of values on totalizers, the dispenser parts marking rules described in the picture apply.

NOTE

Except for the setup and reading of values, the keys A1, A2, L1, L2 and CLEAR can also be used to setup the options on the dispenser. The ON key allows testing the function of display heating. The <0> key allows the unblocking of a dispenser after an error or in the operating when it is blocked after dispensing.

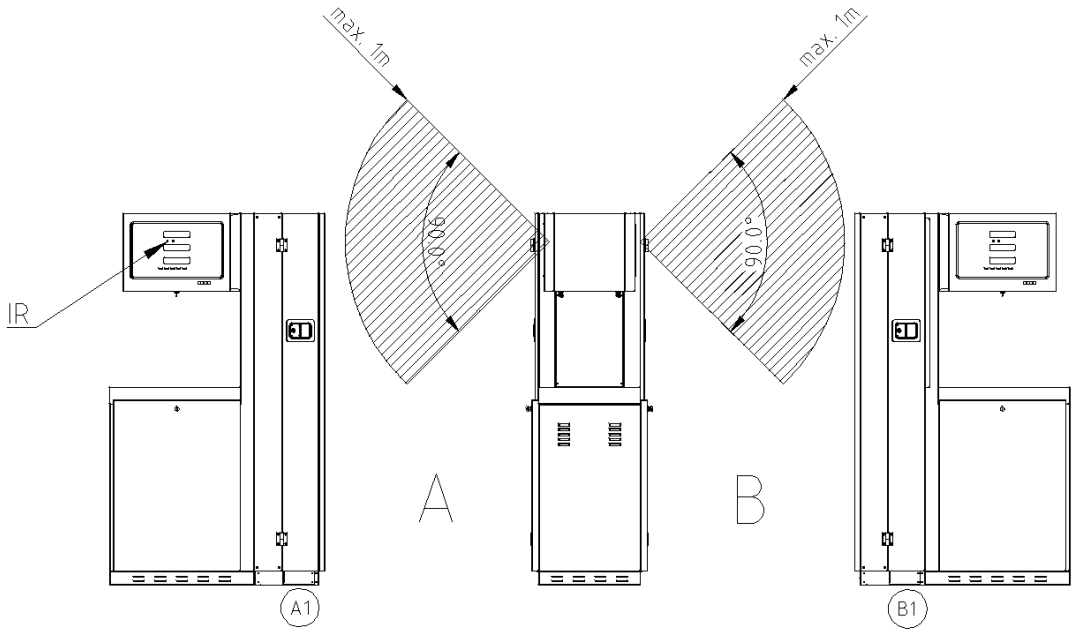
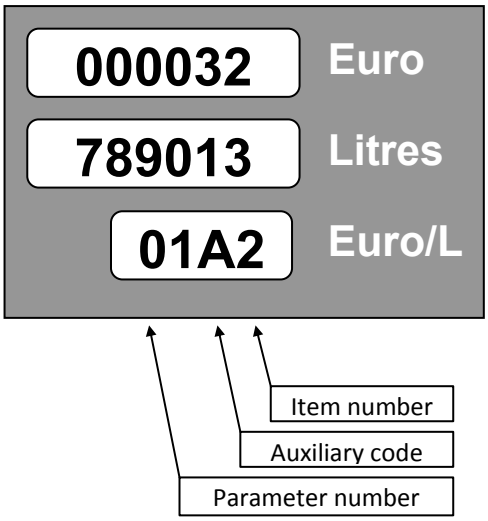


Fig. 9 - ***Range of the remote control and marking of hoses of AdBlue® dispenser***

3.1.2. DISPLAYING DATA IN SETUP MODE

All data in the setup modes are shown on the dispenser's display. When using the remote control, the data are shown on the display of the side from which the setup mode was triggered. Individual parameters are displayed as follows:

Parameter number:	01
Item number:	2 (dispensing hose number)
Auxiliary code:	A (dispenser side)
Parameter value:	327890 13 (volume in centiliters)



3.1.3. OPERATOR MODE

The operator mode is triggered by pointing the IR remote controller at the fuel dispenser's display (at a distance of approx. 1 m from the dispenser's display center) and pushing the button <**S**> followed by <**R**>. **All nozzles must be hanged in their nozzle boots and the current transaction must be completed (paid) before starting.**

After entering into the operator mode the value of the first parameter is displayed. To navigate to the following parameters and their items, use the keys <**>**> and <**+**> (see Fig. 8).

The operator mode allows displaying, **but not changing**, the value of the parameters shown in Table 7.

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and cash amount totalizers (resettable)
03	Product unit prices (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest transaction history

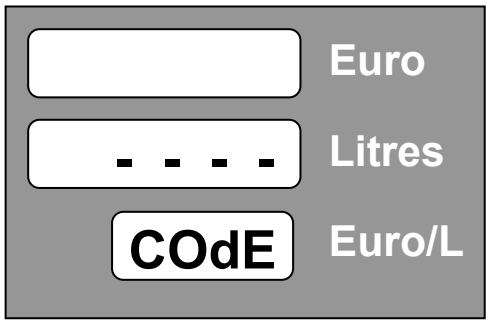
Table 7 – List of parameters in operator setup mode

Individual parameters will be described in the following chapter.

The operator mode can be terminated by pushing the button **<R>**. The mode is also terminated automatically if no remote controller button is pushed for over 60 seconds.

3.1.4. MANAGER MODE

Use the remoter controller (at a distance of approx. 1 m from the dispenser's display center) and push the button <**R**>. **All nozzles must be hanged in their nozzle boots and the current transaction must be completed (paid) before starting.** After entering into the manager mode, the display will ask for a 4-digit access password:



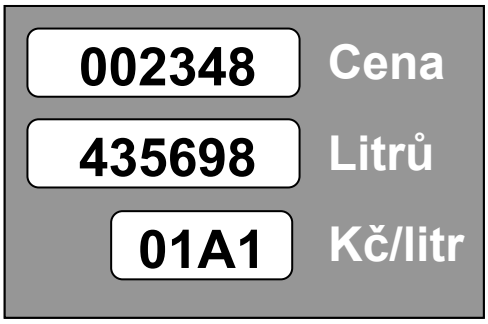
In order to maintain password secrecy, numbers are displayed as dashes. The default access password is "1111".

Example:

Push the keys <**1**><**1**><**1**><**1**> and <**ENT**>.

NOTE

If the station manager forgets the valid password, it is necessary to call the authorized service company and set a new password.



After entering the valid access password, the display will show the value of the first parameter 01. Now you can scroll through the parameters using <>> or by entering the **search parameter number** on the remote controller and confirming with the key <**ENT**> to move directly to the required parameter.

The manager mode enables displaying and changing the values of parameters included in Table 8.

Parameter	Description
01	Non-resettable volume totalizers
02	Daily volume and amount totalizers (resettable)
03	Unit price of products (in manual mode)
04	Current time and date
05	Program version and check sums
06	Error message history
07	Latest deliveries history
08	Manager mode access password
09	Maintenance history
10	- not used -
11	- not used -
12	Fuel dispenser control mode
13	Statistics of errors
14	Current operating temperature
15	Reset of the daily totalizers
16	Manufacturer's lock number
17	Display backlight intensity
18	Text messages
19	Display segment error

Table 8 – List of parameters in manager mode

The manager mode is terminated by pushing the button **<R>**. The mode is also terminated automatically if no remote controller button is pushed for over 60 seconds.

3.1.5. NON-RESETTABLE VOLUME TOTALIZERS (CODE 01)

Electronic totalizers for all dispensing hoses (nozzles) are stored in the electronic counter memory. These totalizers are ***non-resettable*** and they indicate the total volume dispensed by individual hoses.

Parameter	Description
011A	fuel volume dispensed by hose 1 on side A in centiliters (x 0.01L)
011B	fuel volume dispensed by hose 1 on side B in centiliters (x 0.01L)

Table 9 – Description of values of parameter P01

3.1.6. DAILY TOTALIZERS (CODE 02)

Electronic daily totalizers for all dispensing hoses (nozzles) are stored in the memory of the electronic counter. **These totalizers can be reset anytime using the P15 parameter** (see the description below). They indicate the total volume and total amount of money dispensed by the individual hoses following the most recent reset.

Parameter	Description
02L1 (A)	Volume dispensed by hose 1 on side A in centiliters (x 0.01L)
02C1 (A)	Cash amount dispensed by hose 2 on side A in currency unit
02L1 (B)	Volume dispensed by hose 1 on side B in centiliters (x 0.01L)
02C1 (B)	Cash amount dispensed by hose 2 on side B in currency unit

Table 10 – Description of values of parameter P02

3.1.7. UNIT PRICE (CODE 03)

This function allows displaying and setting of the current unit price for AdBlue®, i.e. the price for one liter. The fuel unit price is set on the display after the nozzle is lifted and the display is reset, in case the dispenser works in the **manual mode**.

The setup is carried out by pushing the **<Ent>** key, entering the price in the CCCC format and confirming with the **<Ent>** key again. No decimal point is used. For example, the price 1.03 Euro/L is input as 0103.

Parameter	Description	Default setting
03 1	Unit price of product 1	0,00 Euro / L

Table 11 – Description of values of parameter P03

NOTICE

*The values set for the P03 parameter are valid **only in the dispenser's manual mode**. If the fuel dispenser is connected to the station's central system, the fuel unit price is set directly by the control system prior to every fuel delivery. The P03 parameter value is not functional in this case.*

NOTICE

*The dispenser **does not allow dispensing for zero value of the unit price.** In such cases, the display of the dispenser will show an E30 error message after lifting the dispensing nozzle and dispensing will not commence.*

3.1.8. CURRENT TIME AND DATE (CODE 04)

This function allows displaying and setting of the current time and date.

The first line of the display shows the time in the "HHMMSS" format (hours, minutes, seconds), the second line shows the date in the "DDMMYY" format (date, month, year) – for example: 15:35:11, 24.12.2011

Setting is done by pushing the **<Ent>** key, entering the time/date in the proper format, and confirming by pushing

<Ent> again.

Parameter	Description	Default setting
04 1	Date setting - format DDMMRR (e.g. 241211 → 24. 12. 2011)	1.1.2001
04 2	Time setting - format HHMMSS (e.g. 153511 = 15:35:11)	0:00:00

Table 12 – Description and setting of values of parameter P04

NOTE

The time and date is displayed on the graphical proportional display and it is used in parameters P06 and P07 to record the times of errors and times of fuel dispensing completion.

NOTICE

48 hours after an interruption of the power supply to the fuel dispenser, the internal clock is reset. The time and date values will change to the default setting and they must be set up again!

3.1.9. DISPLAYING OF THE PROGRAM VERSION AND CHECK SUMS (CODE 05)

This function shows the number of the dispenser counter program version and various check sums. These values serve for the inspecting metrology authorities and authorized service technicians.

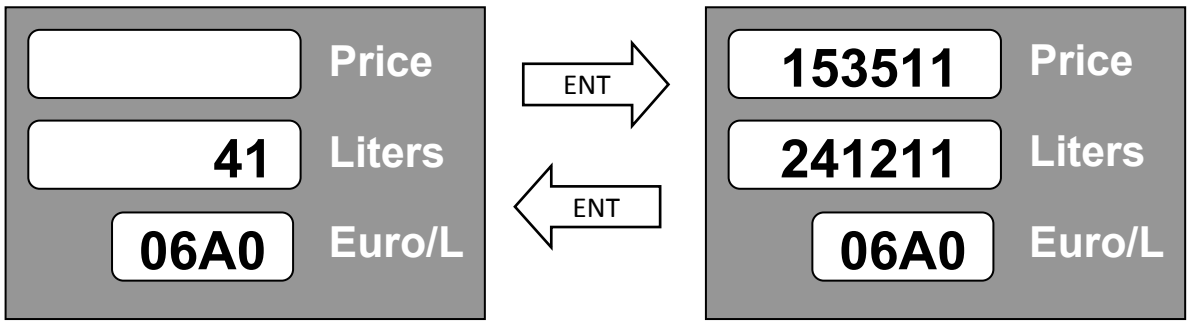
Parameter	Description
05 1	Program version + edition (e.g. 1.03 + 7)
05 2	Check sum W&M (20260)
05 3	Check sum of program (e.g. 52359)
05 4	Check sum of parameter memory P20-P99 (e.g. 34567)
05 5	Check sum of temperature compensation device (e.g. 47644)
05 6	Time and date of program creation (e.g. 19. 07. 2011, 07:56:17)

Table 13 – Description of values of parameter P05

3.1.10. ERROR MESSAGE HISTORY (CODE 06)

This function serves to show the history of the last ten error messages for malfunctions of the fuel dispenser.

The table of error messages can be found in Chapter 5.3 on page 56.



After switching to parameter P06, the display will show the code of the last error message on side A of the dispenser (e.g. 41 - E41 hose 1A pulser error). After pushing the **<ENT>** key, the time and date when the error occurred is shown. After pushing the <**+**> key the display shows the code of the last error message on side B of the dispenser. See more in Table 14.

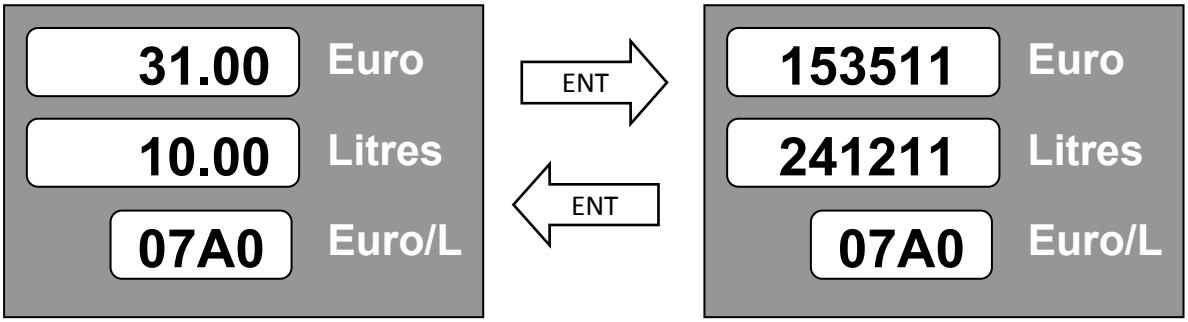
Parameter	Description
06A0	Code of the latest error on side A
06B0	Code of the latest error on side B
06A1	Code of the next to latest error on side A
06B1	Code of the next to latest error on side B
…	…
06A9	Code of the tenth latest error on side A
06B9	Code of the tenth latest error on side B

Table 14 – History of error messages P06

NOTE
In case there are two errors at the same time with the same error code immediately after each other, only the last one will be stored in the counter memory.

3.1.11.HISTORY OF LATEST TRANSACTIONS (CODE 07)

This function serves to show the history of the last ten fuel deliveries (transactions) on each side of the dispenser. This parameter has the following data layout on the display:



After switching to parameter P07, the display will show the code of the last transaction on side A of the dispenser (e.g. 31 EUR / 10L). The price per liter alternates on the display with the parameter number. After pushing the <**ENT**> key, the time and date of fuel delivery completion is shown. After pushing the <**+**> key, the display shows the code of the last error message on side B of the dispenser. See more in Table 15.

Parameter	Description
07A0	Latest transaction on side A
07B0	Latest transaction on side B
07A1	Next to latest transaction on side A
07B1	Next to latest transaction on side B
…	…

Parameter	Description
07A9	Tenth latest transaction on side A
07B9	Tenth latest transaction on side B

Table 15 – History of latest transactions P07

NOTE
If the memory bank for the fuel delivery history is empty, i.e. there is no data stored in the memory, the display will only show "------".

3.1.12.ACCESS PASSWORD TO THE MANAGER MODE (CODE 08)

This function allows displaying and/or changing the access password for the manager mode. The factory set default access password is "1111".

3.1.13.MAINTENANCE HISTORY (CODE 09)

This function allows displaying the codes of the last 10 service remote controllers that were used to set parameters of the counter.

3.1.14.DISPENSER OPERATING MODE (CODE 12)

This function defines the type of the operating mode of the dispenser.

Parameter	Description
12 = 0	Automatic mode with remote control via standard protocol PDE
12 = 1	- unused -
12 = 2	- unused -
12 = 3	Manual mode

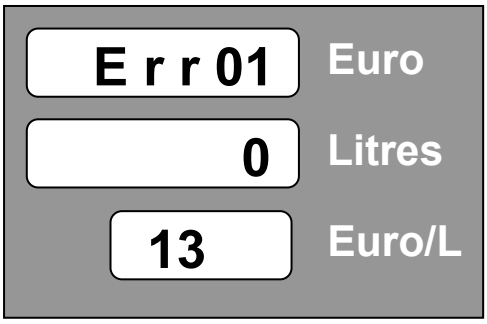
Table 16 – Dispenser operating mode P12

The parameter can have the value 0 or 3:

- If the parameter **P12 value equals 0**, the dispenser operates in a purely automatic mode, i.e. it is connected to the control computer via a data line. The dispenser is fully controlled by the remote control unit (counter, control panel etc.) – release of the dispenser for AdBlue® dispensing, blocking of the dispenser, setting of the fuel price and the maximum amount/volume for each transaction, etc. Shortly after interruption of communication between the computer and the dispenser, the display will show the error message E18. Once communication is restored, the E18 error message disappears.
- If the parameter **P12 value equals 3**, the dispenser operates in a purely manual mode. The dispenser is fully independent – not controlled remotely. The data line is blocked. The unit price of the medium is controlled by the P03 parameter. Unless a special manual mode with blocking after dispensing or a mode with the RELEASE signal controlling is set, the dispensing starts immediately after the nozzle is lifted and the display reset.

3.1.15.ERROR STATISTICS (CODE 13)

The function serves to show statistics about errors that have occurred on the dispenser since its initialization or counter resetting. This parameter has a different data layout in the display:



The first line of the display shows the dispenser error code - 01 through 59; the second line shows the frequency of the error occurrence since the dispenser was commissioned or since a reset of the statistics took place.

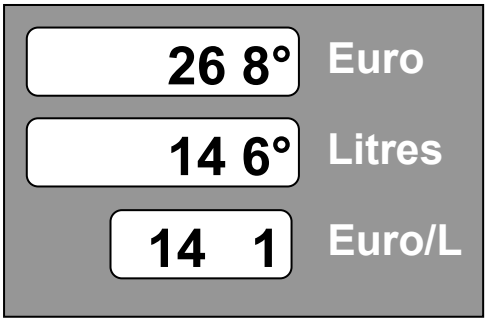
Scroll through the error statistics is possible via the keys <**+**> and <**-**>.

A table of the error messages is found in Chapter 5.3 on page 56.

3.1.16.CURRENT OPERATING TEMPERATURE (CODE 14)

This function shows the current temperature measured by the thermal sensor on the processor board of the counter, or the current temperatures of the thermal sensors Pt100 located in the dispenser's hydraulics, if installed.

This parameter has the following data layout on the display:



The first line of the display shows the temperature on the counter's processor board in decimals of degree Celsius (26.8°C). The second line shows the temperature of the AdBlue® medium in the dispenser's hydraulic system in decimals of degree Celsius (14.6°C).

Scrolling through fuel products is possible by using the keys <**+**> and <**-**>.

Parameter	Description
14 1	Ambient temperature around the counter's processor and temperature of the medium

Table 17 – Current operating temperature P14

NOTE
The thermal sensor Pt100 for measuring the temperature of the AdBlue® medium is not a part of the standard dispenser delivery.

3.1.17.RESETTING DAILY TOTALIZERS (CODE 15)

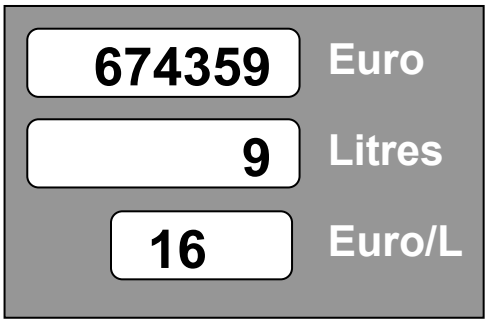
This function serves to reset all daily totalizers of all hoses/nozzles.

After setting the value of the parameter to **1** and confirming (<**ENT**> + <**1**> + <**ENT**>), all totalizers that are subject to parameter P02 are **reset**.

3.1.18.MANUFACTURER'S LOCK CODE (CODE 16)

This function server for displaying the 6-digit operation controlling number and for inputting the manufacturer's lock code in case the dispenser is locked or operated within the trial period.

This parameter has the following layout of data in the display:



The first line of the display shows a numeric code (operation controlling number) necessary to unlock the dispenser remotely. The second line shows the number of days in trial period operation, after which the dispenser will be locked. If the first line is empty and if there is 0 on the second line, the dispenser is in the standard operating mode.

3.1.19.DISPLAY BACKLIGHT INTENSITY (CODE 17)

This function allows setting the intensity of the LED backlight of the graphical proportional display PDEDCU. For all other types of displays, the parameter does not work.

Parameter	Description
17 = 0	The display backlight is not being regulated
17 = 1-100	PWM value of display backlight intensity

Table 18 - Intensity of display backlight P17

The standard default setting of the parameter is 70.

3.1.20.TEXT MESSAGES OF THE GRAPHICAL DISPLAY (CODE 18)

If the dispenser has the graphic proportional display PDECPU, this function allows adjusting the length of text messages that appear on the screen. Text messages can be divided into two groups:

- descriptions of the display
- advertising messages

The parameters reserved for the description of the display can have the value 0 and 1. When the value is 0, the message is not shown on the display. When the parameter value is 1, the message is shown.
The parameters reserved for advertisement texts can have the values 0 through 9. When the parameter value is 0, the advertising message is not shown on the display, when the value is 1 through 9, the advertising message remains on the screen for 1 to 9 seconds (according to the parameter value). The advertising messages are shown on the display in the order 1, 2... through 9, during the time when the dispenser is idle, when the latest transaction has been completed (paid). The advertising message disappears as soon as the dispensing nozzle is lifted and the refueling starts.
The list of usable parameters and their meaning can be seen in Table 19.

Parameter	Description	Default setting
18 6	Description of amount display	0 – do not display
18 7	Description of volume display	0 – do not display
18 8	Description of unit price display	0 – do not display
18 11	Advertising message No. 1	0 – do not display

Parameter	Description	Default setting
18 12	Advertising message No. 2	0 – do not display
18 13	Advertising message No. 3	0 – do not display
18 14	Advertising message No. 4	0 – do not display
18 15	Advertising message No. 5	0 – do not display
18 16	Advertising message No. 6	0 – do not display
18 17	Advertising message No. 7	0 – do not display
18 18	Advertising message No. 8	0 – do not display
18 19	Advertising message No. 9	0 – do not display
18 20	Description in case of pre-selection of amount	0 – do not display
18 21	Description in case of pre-selection of volume	0 – do not display

Table 19 – Text messages of graphical display P17

NOTE

Parameter 18 is only functional for the graphic proportional display PDEDCU. For other types of displays it does not work.

3.1.21.DISPLAY SEGMENT ERROR (CODE 19)

This function allows switching on/off the displaying of a display segment error (E1) by the processor.

Parameter	Description
19 = 0	Display segment error will not be displayed
19 = 1	Display segment error will be displayed

Table 20 – Displaying the display segment error P17

The default setting of the parameter value is 1.

3.2. TBELTX COUNTER (TBELT2 OR TBELT4)

The electronic counter TBELTx for fuel dispensers, produced by the company TATSUNO EUROPE a.s., is set up via a 4-key keyboard, or by a pre-setting keyboard if it is installed on the dispenser. It allows the following:

- set up unit prices of fuel products (in case of manual operation)
- reading of non-resettable electronic liter totalizers of all dispensing hoses
- dispenser operating mode change

3.3.1. PRODUCT UNIT PRICE SETTING

If the dispenser is in the manual mode, the dispensed value calculation uses the product unit prices stored in the counter memory. Any change in the unit price of fuel on the counter's display comes into effect only after the dispensing nozzle is lifted. The factory-set default price for all products is zero. Unless a non-zero price is set, the error message "E30" – "zero price" will be displayed and the refueling will not start.

If the dispenser is in the automatic mode, the calculation of the dispensed amount uses the product unit price sent by the station's control computer upon releasing every fuel dispensing. The prices stored in the P03 parameter of the counter's memory are not functional in this case.

AdBlue® price setting procedure (manual mode):

The fuel unit price can be changed only in the time between switching the counter's power on and the first fuel delivery from the dispenser.

1. Switch the counter power off and on again.
2. Push and hold the button 2 along with button 4 for at least 3 seconds.
3. The middle line will display the number of the nozzle (product) that is being adjusted, the bottom line will display the unit price. The price is changed digit by digit. The currently adjusted digit will flash.
4. Button 1 allows changing the value of the flashing digit.
5. Button 2 allows moving from one digit to the next.
6. Button 3 allows changing the nozzle number for which the price is being adjusted.
7. Price setup is terminated by pushing the button 4.

NOTE
The fuel product marking system in the dispenser is described in Fig. 9 on page 17.

3.3.2. READING OF ELECTRONIC TOTALIZERS

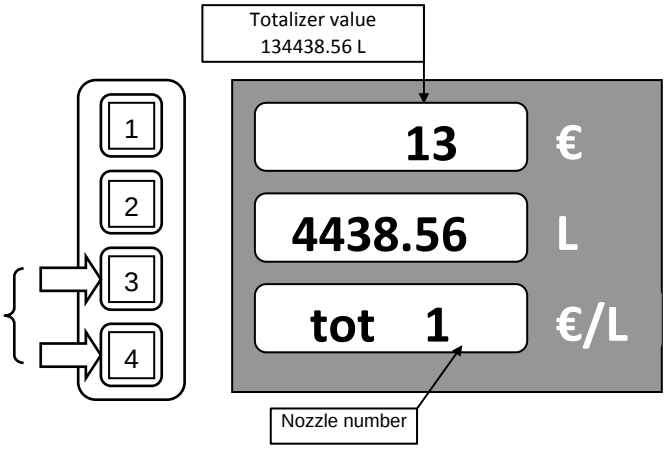
The counter TBELTx is equipped with electronic volume totalizers for each dispensing nozzle/hose. The value of these totalizers can be found using the pre-set keyboard or by a command sent via the communication line.

The totalizers can be reset to zero by means of the P18 configuration parameter. The totalizers can be zeroed only if the switch SW1-1 is in the OFF position.

Electronic totalizers reading procedure:

The value of the meters can be shown on the counter's display only when all nozzles are in nozzle boots and when the last fuel delivery has been paid.

1. Push and hold the buttons 3 and 4 simultaneously for at least 3 seconds.
2. The nozzle number will appear on the bottom display line. The upper and middle lines show the totalizer value (the upper line shows higher digit positions).
3. The buttons 1(+) and 2(-) allow changing the nozzle number.



4. Totalizer reading is terminated by pushing the button 4 (Cancel).

NOTE

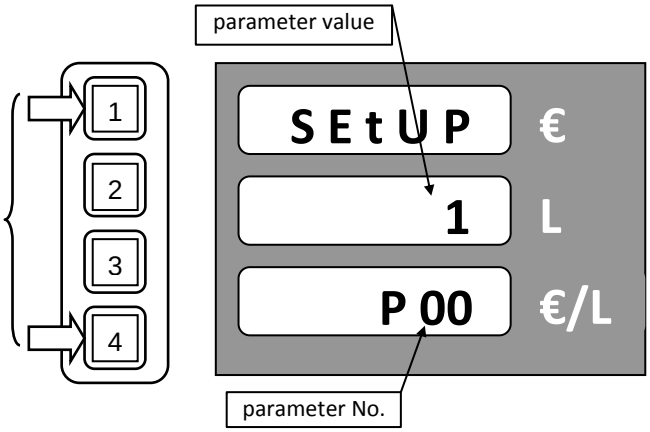
The product marking system of the dispenser is described in Fig. 9 on page 17.

3.3.3. OPERATING MODE CHANGE

The fuel dispenser operating mode must be changed when the dispenser needs to be disconnected from the control system (e.g. in case of control system malfunction), when the dispensers must be operated manually, or vice-versa when the dispenser is operating in manual mode and needs to be connected to the remote control system.

Operating mode change procedure:

1) Switch the counter power off and on again.
2) During the counter test (countdown to zero) press and hold the buttons 1 and 4 simultaneously, until the letter “P” starts flashing on the bottom line. This signals the initialization of the setup mode.
3) After the counter test finishes, the P00 parameter number will appear on the bottom line.
4) The current value of this parameter willappear on the middle line.



5) Preparing the parameter for setup is done by pressing the 3 key (Enter).
6) Upon preparing the parameter, the digit starts to flash.
7) The value of the parameter is changed via keys 1 and 2 to the value of 0 for automated mode, or to 1 for manual mode.
8) The new parameter value is saved by pushing the 3 key (Enter).
9) The parameter setting mode is terminated by holding the 4 key for at least 2 seconds (Cancel).

4. OPERATION

4.1. INSTRUCTIONS FOR SAFE USE

The AdBlue® dispenser is a complicated device that must be able perform many demanding functions. It is therefore necessary to ensure the following procedures before commissioning:

a) Pressure test of AdBlue® dispenser along with all pipes with a pressure of 0.35 MPa;

b) Revision of the electrical distribution network and the connections of the wiring, in order to prevent electrocution and provide explosiveness proofing.

Fig. 10 – No smoking

Fig. 11 – No open fire

Fig. 12 – No mobile phones

CAUTION

● Technical and technological equipment must comply with the approved conditions, which comprise instructions for safe operation and maintenance as well as istructions for emergency situations. Snow fire extinguishers must be available close to the AdBlue® dispenser in accordance to fire safety rules.

● When selling and dispensing AdBlue®, the determined procedure has to be adhered to; in case of any danger the device must be put out of operation immediately.

● It is necessary to adhere to the set deadlines for regular inspections and checks of the complete AdBlue® dispenser; any intervention by persons without relevant competence, capability and qualification into the installed technology is strictly forbidden.

● Regular maintenance and service may only be carried out by the authorized service company.

● The operator shall keep the device in the original safe state; any defect or unusual phenomenon must be reported to the service organization immediately; in case of danger of delayed intervention the device must be put out of operation.

4.2. PUTTING THE ADBLUE® DISPENSER INTO OPERATION

AdBlue® dispensers are switched on and off at the main distributor of the petrol station, where the power to the dispensers leads. Each AdBlue® dispenser has two power supply points from the main distributor:

- Power supply of the electronic counter and switching circuits (230V stabilized)
- Power supply of the hydraulic part of the dispenser (230V unstabilized)

Both the supply points are protected with adequate circuit breakers that switch the AdBlue® dispensers off and on.

RECOMMENDATION

Turning the dispenser on should be carried out as follows:

1) Turn on the UPS backup power source located in the kiosk (if installed)

2) Turn on the 230V circuit breaker for stabilised power supply to the electronic counter of the AdBlue® dispenser (an automatic test of all display segments will be performed and the dispenser's display will show the values of the last refuelling)

3) Turn on the 230V circuit breaker of unstabilized heating power supply and vacuum AdBlue® pump

Now the AdBlue® dispenser is ready to start dispensing.

4.3. OPERATION OF THE ADBLUE® DISPENSER

NOTICE

The operator is responsible for the operation of the petrol station and must monitor the progress of fuel drawing. If a customer at the self-service dispensers violates the required procedures, the operator must inform the customer about the proper manipulation rules. The operator must also mark the danger areas with warning symbols in Czech (no smoking, no open fire, direction of arrival to the dispenser). There must be openly accessible operation rules displayed for the customer, if he or she should need any info about the basic requirements.

The AdBlue® dispenser is started by taking the nozzle out of the holder (nozzle boot), which also causes a display reset on the electronic counter. The electromotor of the AdBlue® submersible pump starts and after pressuring is complete (approx. 3 seconds), the controlling electromagnetic valve inside the dispenser is opened. Dispensing of AdBlue® can be commenced at this point. The dispensing speed is controlled via the dispensing nozzle. The dispensing is terminated by closing the nozzle (releasing the control lever) and setting it back into the holder, which also closes the electromagnetic valve and turns off the submersible pump. The data about the dispensed fuel quantity, cash amount and price are shown on the display and in the electronic calculator memory, and remain displayed until the next lifting of the nozzle, or until the amount is paid.

4.3.1. ADBLUE® DISPENSING

The procedure for AdBlue® dispensing is different from the one for petroleum and diesel fuels. Prior to using the AdBlue® dispenser, make sure that you have read and understood all safety procedures referred to in section 0 of this User Manual.

If in doubt about any of the following procedures, seek assistance from the Station Operator. Always follow the instructions on the AdBlue® dispenser.

ATTENTION

The AdBlue® medium may only be dispensed into vehicles with a special AdBlue® tank.
The AdBlue® tank is fitted with a safety mechanism that opens the dispensing nozzle upon its insertion into the tank. Other types of tanks do not facilitate this.

The following instructions must be followed to ensure safe operation of the AdBlue® dispenser:

1) Select a filling position and park your vehicle so that the AdBlue® tank opening is adjacent to the AdBlue® nozzle. Where possible, avoid parking your vehicle in such a way that the nozzle and hose need to be pulled over your vehicle in order to insert the nozzle in the tank opening.
2) Apply the handbrake and switch off the ignition. Switch off mobile telephones and extinguish any other potential sources of ignition, e.g. cigarettes.
3) Where applicable, remove the cap of your vehicle tank opening(s).
4) Open the cover (door) of the AdBlue® hose on the dispenser.
5) Remove the AdBlue® nozzle from the dispenser housing and insert it into the vehicle tank.

NOTE

The AdBlue® nozzle may be fitted with a magnet that automatically opens the AdBlue® vehicle tank to allow insertion of the nozzle.

ATTENTION

TATSUNO generally advises against the use of adaptors; however where they have to be used, the adaptor must be connected first to the vehicle tank, and only then the dispenser nozzle is connected to the adaptor.

6) Make sure that the AdBlue® nozzle is securely inserted into the vehicle tank opening and commence dispensing.
7) Verify that the calculator resets to display zero for the total volume and amount to pay and the unit price is correct.
8) Do not pull on the hose violently and do not allow it to be crushed, flattened or kinked. Avoid any contact between the hose and the exhaust pipe on the underside of your vehicle. A hot exhaust could burn the hose, causing danger to all persons on the forecourt.

NOTE

Take extra care in cold weather as the flexibility of the hose decreases and the ease of retraction is reduced.

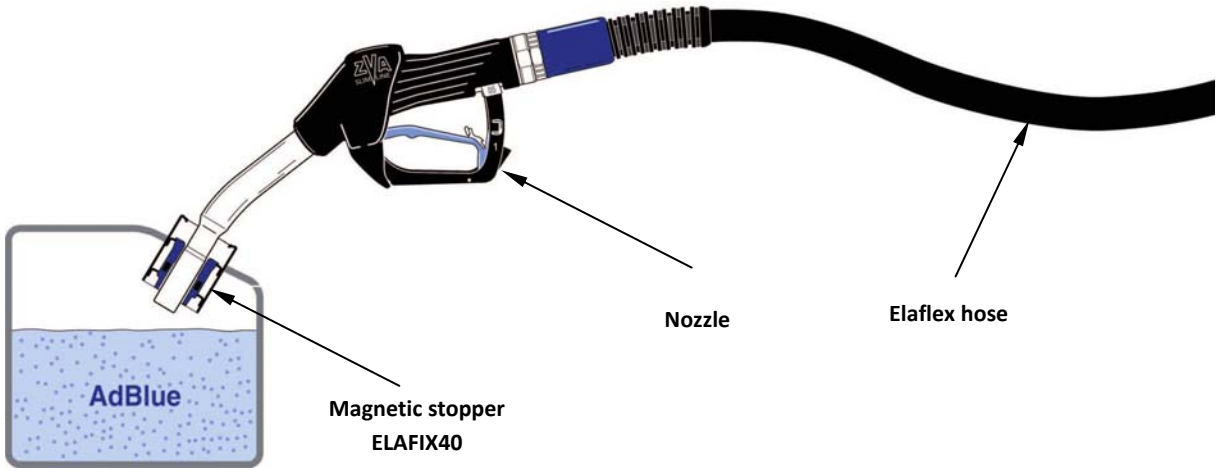
9) Ensure that the hose does not obstruct public passage nor constitute a trip hazard.
10) Release the nozzle trigger when the required amount of AdBlue® has been dispensed or until your tank is filled up (the delivery will cease automatically at this point).
11) Remove the AdBlue® nozzle from the AdBlue® tank inlet and replace it in its holder
12) Close the cover (door) of the AdBlue® hose on the dispenser.
13) Disconnect the adaptor (if used) and close the AdBlue® tank.
14) Ensure that payment is made as required (in the kiosk or at the payment terminal).
15) Drive away from the filling position slowly and carefully.

4.3.2. CORRECT ADBLUE® NOZZLE USAGE

AdBlue® dispensers are supplied with a special **Elaflex AdBlue® nozzle** fitted to the end of the hose. As a safety feature, this **nozzle may contain a magnet** which only allows insertion of the nozzle into dedicated AdBlue® vehicle tanks. Always follow the instructions positioned near the nozzle boot on the dispenser to ensure cusomer safety and correct operation when dispensing the AdBlue® liquid. The following directions are guidelines for using the most common AdBlue® nozzle found on TATSUNO dispensers. In order to reduce the likelihood of AdBlue® liquid freezing in the hose and nozzle, the AdBlue® nozzle is protected by a nozzle plug.

NOTE

Refuelling with the ZVA AdBlue® nozzle is only possible in combination with the ELAFIX 40 magnet adapter. The fixed magnetic field in the filler neck opens the magnetic stopper in the spout, preventing unwanted dispensing into petrol or diesel tanks. The dispensing of fuel into the AdBlue® tank is also impossible, because petrol and diesel nozzles do not fit into the ELAFIX 40 magnet adapter opening.



Obr. 13 – Příklad čerpání do nádrže s pistolí ZVA AdBlue® a magnetickou zátkou

ATTENTION

Avoid AdBlue® spillage onto the forecourt as this will cause a slippery surface!

NOTE

Ensure the nozzle is correctly stowed in the nozzle boot before closing the door.

4.3.3. ADBLUE® THERMOSTAT AND HEATERS

All AdBlue® dispensers are fitted with thermostatically controlled heaters designed to prevent the AdBlue® liquid from freezing in the dispenser in temperatures below 0°C.

ATTENTION

Do not switch the dispenser off when the ambient temperature drops below 0°C! It is imperative to avoid the freezing of the AdBlue liquid inside the dispenser and the resulting piston meter damage!

4.3.4. PRE-SELECTION KEYBOARD

TATSUNO AdBlue® dispensers can be fitted with a pre-selection keyboard for presetting of the sum or volume on the AdBlue® dispenser directly by the customer. Prior to commencing dispensing, the customer can choose the dispensed volume or price.

NOTE

If the pre-selection keyboard is installed, the AdBlue® dispensers must be equipped with pre-selection deceleration valves, which provide safe deceleration of the flow rate before the selected value is reached.

Example of pre-setting in CZK

1) The customer arrives at the AdBlue® dispenser and wishes to refuel for 250 CZK.
2) The customer loads the value 250 (by pressing the <100 CZK> key twice and the <10 CZK> key five times), releases the nozzle from the dispenser and connects it to the vehicle tank.
3) The electronic calculator is reset, the electric motor of the submersible pump is turned on and the AdBlue® medium starts being dispensed into the vehicle tank.
4) The AdBlue® dispenser dispenses precisely the preset sum and stops automatically.

Example of pre-setting in liters

1) The customer arrives at the AdBlue® dispenser and wishes to refuel 28 liters.
2) The customer loads the value 28 (by pressing the <10 L> key twice and the <1 L> key eight times), releases the nozzle from the dispenser and connects it to the vehicle tank.

3) The electronic calculator is reset, the electric motor of the submersible pump is turned on and the AdBlue® medium starts being dispensed into the vehicle tank.
4) The AdBlue® dispenser dispenses precisely the preset sum and stops automatically.

Note: Dispensing to the pre-selected value can be cancelled by pressing the <**Zruš**> (Cancel) key before the dispenser starts pumping. Then another value can be pre-selected or the standard refueling may be applied (without using the pre-selection).

4.3.5. ELECTROMECHANICAL LITER TOTALIZERS

TATSUNO EUROPE AdBlue® dispensers are equipped with electromechanical totalizers (as a standard) for monitoring the total AdBlue® volume dispensed by each hose. The totalizers are placed on the dispenser display. Each dispensing hose/nozzle is linked to one 7-digit totalizer that shows the number of full litres dispensed by the relevant hose.

4.4. END OF ADBLUE® DISPENSER OPERATION

RECOMMENDATION

Switching the AdBlue® dispenser power off should be carried out as follows:

1) **Switch off the 230V circuit breaker for the dispenser hydraulics heating.**
2) **Switch off the 230V circuit breaker for stabilized feeding of the electronic calculator.**
3) **Switch off the UPS source situated in the kiosk, using the switch button on the panel (the green pilot light on the UPS source goes off).**

5. MAINTENANCE AND SERVICE

CAUTION

Prior to starting any maintenance intervention into mechanical, hydraulic or electric parts, it is always necessary to disconnect the AdBlue® dispenser from the power supply source and to reliably protect it from re-connecting inadvertently.

CAUTION

DO NOT OPEN THE JUNCTION BOX COVER IF THE ADBLUE® DISPENSER IS ENERGIZED!

CAUTION

Electric and electronic parts may be serviced only and exclusively by specialists liable for safety of the device. Upon completing an intervention, all conductors must be re-connected. Correct conductor installation must prevent any contact with the moving parts of the winding module.

CAUTION

After each service intervention, the tightness of the hydraulic assemblies has to be inspected; any leaks must be removed.

5.1. MAIN PRINCIPLES FOR ADBLUE® DISPENSER MAINTENANCE

- maintain all functional parts and assemblies of the dispenser clean, so that in case an unforeseeable fault arises, it can easily be identified and quickly removed
- monitor the condition of nozzles and decide upon their repair or replacement in case of a defect
- monitor door locks and nozzle accommodation boots for correct functioning
- maintain the AdBlue® dispenser clean, pay special attention to cleaning of calculator glass
- lubricate the nozzle by silicone oil twice a week

Maintenance of the AdBlue® dispenser "body"

Parts of the AdBlue® dispenser body, lacquered or made of stainless steel, need regular maintenance. Greater attention should be paid to these parts particularly in the winter season, because aerosols of chloride preparations that arise from the salts used for road maintenance can result in permanent damage of lacquers

of untreated body parts and/or in intercrystalline corrosion of guards made of stainless steel. Regular maintenance of the AdBlue® dispenser body is to be carried out by water and/or a solution of detergents and available car cosmetic preparations.

The owner of the AdBlue® dispenser must:

- Appoint one staff member as responsible for the operation and functionality of the AdBlue® dispenser.
- Secure inspections, testing, repairs and maintenance by professional methods.
- File documents and operating records.
- Ensure that any and all activities connected with operation and service of the AdBlue® dispenser are carried out only and exclusively by staff with relevant authorization.

5.2. PRINCIPLES OF ADBLUE® DISPENSER MONITORING

Monitoring of equipment, tanks, pipes and AdBlue® dispensers are carried out with the periodicity fixed by the bylaws of the service station in accordance with valid regulations.

- Monitor the AdBlue® dispenser hydraulic system tightness (using a soap solution).
- Monitor the machinery (equipment).
- The inspection, calibration, and official verification of the AdBlue® dispenser are carried out by the Czech Institute of Metrology, in accordance with valid regulations (abroad, by a relevant institute). The periodicity of the measuring device calibration is determined by the Act No. 505/1990 Coll.
- The inspection is preceded by a thorough cleaning of the whole device and clearing the tanks of dust, water and other impurities.

5.3. ADBLUE® DISPENSER ERROR MESAGES

Defects of the AdBlue® dispenser lead to the locking of refueling operation and to the displaying of an error message on the AdBlue® dispenser display in the format “E” + Error Code. Depending on the error, the result is either the blocking of the complete dispenser (fatal error), or the blocking of the specific part where the error occurred. Nearly all error messages can be cleared off the display by lifting and re-suspending the nozzle, by switching the electronic unit power on and off and/or by pressing <**0**> on the remote controller (only with the PDEX electronic calculator).

All error messages are saved in the calculator memory, where it can be displayed using the parameter 06 (Erro history) and 13 (Fault statistics).

5.3.1. ERROR MESSAGE TYPES

Message Type	Method of dispenser blocking	Method of dispenser unblocking
LOCK (operational blocking)	Blocks a part of the dispenser	Re-suspending the dispensing nozzle will remove the message from the display.
ALERT (warning)	Blocks the part of the dispenser where the error occurred. The message code is recorded into the history and statistics.	The message is removed from the display once the cause of the error is repaired.

NFAT (non-fatal error)	Blocks the part of the dispenser where the error occurred. The message code is recorded in the history and statistics.	Re-suspending the dispensing nozzle will remove the message from the display. It is possible to unblock the dispenser and cancel the error by means of a remote controller, or by unblocking the dispenser via the data line.
FATAL (fatal error)	Blocks the whole dispenser and the message code is recorded in the history and statistics.	The cause of the error must be removed and the power supply to the dispenser's counter must be turned off and on.

5.3.2. ERROR MESSAGES CODES

Message Code	Message Type	Cause of the error message	Fix for the error message
OFF	FATAL	**Supply power blackout** Supply power blackout longer than approx. 3-5 periods, t > 100ms	The power supply to the dispenser's counter must be turned off for approx. 10 seconds and then turned on.
STOP	LOCK	**Exceeding of maximum time for suspension of dispensing P75, or pre-setting of a lower volume value than the value set in parameter P39 – hose dilatation**	The message disappears after re-suspending the dispensing nozzle. Check the setup of parameter P75 (= 60), parameter P39 and pre-setting setup.
E 1	NFAT	**Display error** – malfunction of an LCD display segment or error of an electromechanical display reel.	Exchange of display, or setting the parameter P19 to value 0.
E 2	FATAL	**Display error** – discrepancy between the real number of displays and the set number in parameter P31.	Correcting the number of displays; P31=1 one display, P31=2 two displays Master&Slave, P31=3 two displays Master&Master for PDEDCU display.
E 3	NFAT	**Vapor recovery error** Error of the vapor recovery flow sensor on side A	Check the function of vapor recovery on side A and the setting of the P81 parameter (0 = no sensor, 6 = sensor VRS1.M)
E 4	NFAT	**Vapor recovery error** Error of the vapor recovery flow sensor on side B	Check the function of vapor recovery on side B and the setting of the P81 parameter (0 = no sensor, 6 = sensor VRS1.M)
E 5	ALERT	**Display error** – error in communication with the display or with the electromechanical totalizer	Check the connection of the display and electromechanic totalizer and their functions
E 6	NFAT	**Electromagnetic totalizer error**	The totalizer is disconnected or unresponsive. Check the value of parameter P74 (0 = disconnected, 1, 2, 3 = connected)
E10	NFAT	**Thermal sensor error**	Check the connection of the thermal sensor Pt100 and the value of the parameter P47 (P47=0 – without compensation, 47=1,2 – temperature compensation)
E11	NFAT	**Incorrect value of medium density**	Check the value of the parameter P48 for the given product.
E12	FATAL	**Error of temperature compensation device** The PDEINP unit is not connected or has a wrong check sum	Check the value of the parameter P47. Check the cable or change the PDEINP unit.
E13	FATAL	**Program error** – error of the metrology or program check sum	Carry out the programming of the counter or exchange of the PDECPU or PDEDUO board.

Message Code	Message Type	Cause of the error message	Fix for the error message
E16	ALERT	**Credit unit error** Error in communication between the counter and credit unit PDECRE	Check the wiring of PDECPU x PDECRE, check the functionality of the credit module PDECRE.
E17	NFAT	**Data line error** Error of the serial communication line, faulty communication data. The controlling computer doesn't send confirmations on time. <ACK>	Check that two dispensers don't share an address. Check the mechanical connection of the data line. Check the function and setup of the data converter. Check the communication process via the monitor.
E18	ALERT	**Data line error** Error of the serial communication line, loss of communication.	The controlling computer is disconnected or the communication cable is not connected correctly. Check the parameter P76. Check the function of the data converter. Check the communication process via the monitor.
E20	NFAT	**Power loss during dispensing** The last transaction was unexpectedly interrupted due to power loss, or due to a processor reset resulting from interference.	Check the dispenser feeding and interference sources (power feeding)
E21	NFAT	**Incorrect position of switches SW1-1 & SW1-4**	Check the position of the switches on the PDEDUO or PDECPU boards. The switch SW1-1 mustí be in the ON position and the switch SW1-4 in the OFF position.
E22	FATAL	**Data initialization** Faulty data in the memory – RAM and EEPROM – invalid check sum.	Check parameter setup. The usual situation after an introduction of a new program version or after the initialization of all parameters by the parameter P99 = 9999.
E25	FATAL	**Electronic totalizer error** Disruption of electronical totalizers. Check sum of the totalizers is faulty.	The dispenser is blocked. Restart the dispenser. Check the totalizers and, if necessary, initialize the totalizers P99 = 6666.
E26	ALERT	**TOTAL STOP button pressed**	The message disappears after unblocking the button.
E27	FATAL	**Blocking of the dispenser by the manufacturer**	Set the parameter 79 to value 0, or enter authorization kode into parameter 16.
E29	NFAT	**Wrong password** A wrong password was input when entering into Manager mode.	Input the correct manager or service password.
E30	LOCK	**The product unit price is zero.**	Set the product unit price of the product at the cash register (P12=0), or in parameter P3 (P12=3).
E31	NFAT	**Pulser error** – error in pulser channel 1 (1A)	Check the value of parameter P45 (=2) Check the connection of pulser channels: **Impulse Generator TATSUNO EK-1025** 2 - green (channel A), 3 - bílá (kanál B) **Generátor impulzů HECTRONIC a LOGITRON** 2 - zelená (channel A) 3 - bílá (channel B) **Generátor impulzů ELTOMATIC** 2 - bílá (channel A), 3 - žlutá (channel B)
E32	NFAT	**Pulser error** – error in pulser channel 2 (2A)	
E33	NFAT	**Pulser error** – error in pulser channel 3 (3A)	
E34	NFAT	**Pulser error** – error in pulser channel 4 (4A)	
E35	NFAT	**Pulser error** – error in pulser channel 5 (1B / 5A)	
E36	NFAT	**Pulser error** – error in pulser channel 6 (2B / 6A)	
E37	NFAT	**Pulser error** – error in pulser channel 7 (3B / 7A)	
E38	NFAT	**Pulser error** – error in pulser channel 8 (4B)	
E41	NFAT	**Pulser error** – error in conenction of pulser 1 (1A)	Check the value of parameter P46 (0 - current <12mA;60mA>, 1 - CHCK, 2 - current + CHCK)
E42	NFAT	**Pulser error** – error in conenction of pulser 2 (2A)	

Message Code	Message Type	Cause of the error message	Fix for the error message
E43	NFAT	**Pulser error** – error in conenction of pulser 3 (3A)	Check the connection of the pulser feeding and CHCK channel: **Impulse generator TATSUNO EK-1025** 1 - red (5V), 4 - yellow (CHCK), 5 - black (0V) **Impulse generators HECTRONIC and LOGITRON** 1 - yellow (5V), 4 - brown (CHCK), 5 - brown (0V) - jumper 4-5 **Impulse generator ELTOMATIC** 1 - green (5V), 4 - brown (CHCK) 5 - brown (0V) - jumper 4-5
E44	NFAT	**Pulser error** – error in conenction of pulser 4 (4A)	
E45	NFAT	**Pulser error** – error in conenction of pulser 5 (1B / 5A)	
E46	NFAT	**Pulser error** – error in conenction of pulser 6 (2B / 6A)	
E47	NFAT	**Pulser error** – error in conenction of pulser 7 (3B / 7A)	
E48	NFAT	**Pulser error** – error in conenction of pulser 8 (4B)	
E51	NFAT	**Aeration of pump** The sensor of pump aeration is active	Check the parameter P83. P83=0… BL inputs are nonfunctional
E52	NFAT	**Aeration of pump** Maximum number of separation tests exceeded	Check the parameter P89. P89=0… number of tests is unrestricted
E54	ALERT	**The effectivity of the vapor recovery system is outside the allowed range.** Unless the fault is removed within 72 hours, the dispenser is blocked (see error message E55).	Remove the fault on the vapor recovery system.
E55	NFAT	**Vapor recovery system failure.**	Remove the fault on the vapor recovery system. Unblock the system VAPORIX using a service adapter.

5.4. ADBLUE® DISPENSER OPERATION

- Service work is carried out in accordance with the fuel station operation rules.
- Before commencing service work, the AdBlue® dispenser must be turned off, fitted with a clearly visible “OUT OF ORDER” tag and the access road must be marked with a “NO ENTRY” sign.
- The AdBlue® dispenser must be disconnected from the power source (the main switch on the switchboard must be turned off).
- The valves on the inlet pipes must be fully closed.
- The passage of vehicles must be blocked within 5 meters of the AdBlue® dispenser during service work.
- A fire extinguisher must be at hand for the service worker.
- Service work may only be done by an authorized worker of the service company.

The service of TATSUNO EUROPE a.s. dispensers is carried out by:

SPEED CZECH SERVICE, s.r.o.
Pražská 2325/68
678 01 Blansko, Czech Republic
info@speedcz.com, www. speedcz.com

HOT-LINE: +420 602 562 277

5.5. WARRANTY AND COMPLAINTS

The contractual warranty is pre-determined – the manufacturer provides a warranty for the supplied unit for 2 years or 1 million liters of dispensed medium as a standard. The warranty does not cover the consumables. When raising possible claims, the following data must be specified:

- Serial number and name – see the rating plate
- Precise description of fault and circumstances under which it occurred

The claim will not be acknowledged in case damaged seals or an unauthorized intervention into the unit is established. Defects and deficiencies resulting from incorrect operation or maintenance are outside the scope of the warranty (e.g. problems resulting by presence of water and impurities in the tank and the hydraulic system). It is necessary to check for presence of water and impurities regularly over the course of operation, and, if necessary, clean the system.

5.6. ACCESSORIES

- Installation and User Manual
- Certificate of Quality and Completeness
- Certificate of Conformity
- Base Certificate
- Base Certificates of all meters installed in the dispenser
- IR controller for operation and setup of the calculator
  (upon request for AdBlue® dispensers equipped with the PDEX counter)
- Base frame (upon request)

Spare Part Catalogue

This document is specified and distributed for service organizations and for servicemen.

NOTES: